UNIVERSIDADE DE LISBOA

Lisbon School of Economics and Management

ESSAYS ON FISCAL POLICY IN THE EUROZONE

Frederico Gonçalo da Silva Leal

Orientador: Professor Doutor António Manuel Pedro Afonso

Tese especialmente elaborada para obtenção do grau de Doutor em Economia

2021

UNIVERSIDADE DE LISBOA
Lisbon School of Economics and Management

ESSAYS ON FISCAL POLICY IN THE EUROZONE

Frederico Gonçalo da Silva Leal

Orientador: Professor Doutor António Manuel Pedro Afonso

Tese especialmente elaborada para obtenção do grau de Doutor em Economia

Júri

Presidente:

Doutor Nuno João de Oliveira Valério
Professor Catedrático e Presidente do Conselho Científico
Instituto Superior de Economia e Gestão da Universidade de Lisboa

Vogais:

Doutor João Alberto de Sousa Andrade
Professor Catedrático Jubilado
Faculdade de Economia da Universidade de Coimbra

Doutor José Manuel Madeira Belbute
Professor Catedrático
Departamento de Economia da Universidade de Évora

Doutor António Manuel Pedro Afonso
Professor Catedrático
Instituto Superior de Economia e Gestão da Universidade de Lisboa

Doutor Manuel Mota Freitas Martins
Professor Auxiliar com Agregação
Faculdade de Economia da Universidade do Porto

Doutor João Oom de Sousa Tovar Jalles
Professor Auxiliar
Instituto Superior de Economia e Gestão da Universidade de Lisboa

2021

Nota Biográfica

Frederico Gonçalo da Silva Leal nasceu em Almada em 27 de abril de 1993.

Licenciou-se em Economia na Universidade da Beira Interior no ano de 2014.

Em 2016, concluiu o Mestrado em Economia na Faculdade de Economia da Universidade do Porto (FEP), com a dissertação "Impacto da crise nos determinantes políticos e económicos dos spreads soberanos - uma aplicação à UEM". Iniciou nesse mesmo ano o Programa de Doutoramento em Economia no Instituto Superior de Economia e Gestão da Universidade de Lisboa (ISEG).

Desde 2015, conta com passagens pelo setor bancário (Caixa Geral de Depósitos e Banco ATLANTICO Europa) e pelo Ministério das Finanças (GPEARI). Recentemente lecionou, enquanto assistente convidado, a unidade curricular de Política Económica e Atividade Empresarial no ISEG e foi técnico especialista no Gabinete do Secretário de Estado da Economia no XXI Governo Constitucional. Atualmente, é técnico especialista no Gabinete do Secretário de Estado Adjunto e da Economia no XXII Governo Constitucional.

A presente tese é o contributo final em ordem à obtenção do grau de Doutor em Economia.

Biographical Note

Frederico Gonçalo da Silva Leal was born in Almada on April 27, 1993.

He graduated in Economics at the University of Beira Interior in 2014.

In 2016, he concluded his Master's in Economics at the School of Economics and Management of the University of Porto (FEP), with the dissertation " *Impacto da crise nos determinantes políticos e económicos dos spreads soberanos - uma aplicação à UEM*". In that same year, he started the PhD Program in Economics at Lisbon School of Economics and Management (ISEG).

From 2015, he worked in banking sector (Caixa Geral de Depósitos and Banco ATLANTICO Europa) and in the Ministry of Finance (GPEARI). Recently, he was guest teaching assistant in the course Economic Policy and Business Activity at ISEG and was advisor to the Secretary of State of Economy in the XXI Constitutional Government. He is currently advisor to the Secretary of State Assistant and of Economy in the XXII Constitutional Government.

This thesis is the final contribution in order to obtain the degree of Doctor in Economics.

Agradecimentos

Em primeiro lugar, agradeço ao Professor António Afonso pela orientação, apoio e sugestões. Sem ele, esta tese não teria sido possível.

Agradeço também à minha família e amigos, com inevitável destaque para a minha mãe e para a minha namorada, que acompanharam diariamente as vicissitudes do meu percurso.

Agradeço aos preciosos comentários dados pelas revistas Applied Economics e International Journal of Finance and Economics, bem como dos arguentes na conferência INFER *Workshop on New Challanges for Fiscal Policy* e do Seminário GPEARI/GEE.

Por fim, agradeço aos meus colegas de Gabinete no Ministério da Economia e Transição Digital, assim como do GPEARI do Ministério das Finanças, por todos os comentários e apoio dado ao longo dos últimos anos.

Acknowledgements

First of all, I would like to thank Professor António Afonso for his guidance, support and suggestions. Without him, this thesis would not have been possible.

I am grateful to my family and friends, with inevitable emphasis on my mother and girlfriend, who followed the issues and difficulties of my journey.

I am also grateful for the precious comments given by the journals Applied Economics and International Journal of Finance and Economics, and by the discussants of the INFER Workshop on New Challenges for Fiscal Policy conference and the GPEARI / GEE Seminar.

Finally, I would like to thank my Cabinet colleagues at the Ministry of Economy and Digital Transition, as well as the Ministry of Finance's GPEARI, for all the comments and support given in the past few years.

Resumo

A política orçamental, através da gestão das receitas e despesas públicas, é usualmente utilizada pelos decisores políticos para influenciar a atividade económica, nomeadamente através do controlo do rendimento disponível, de uma reafectação eficiente dos recursos existentes, do fornecimento de bens e serviços, bem como da correção de falhas de mercado.

De acordo com o disposto na teoria Keynesiana, elaborada durante a Grande Recessão (década de 1930), os efeitos da política orçamental deverão variar de acordo com a fase do ciclo económico e dos instrumentos utilizados, sendo estes mais necessários e eficazes durante recessões. Contudo, em alguns episódios históricos, a evidência empírica parece contrariar as previsões teóricas efetuadas à luz da teoria Keynesiana, originando os comumente chamados efeitos não-Keynesianos da política orçamental.

Por sua vez, a última Grande Recessão trouxe, uma vez mais, o debate relativo à eficácia da política orçamental para a literatura económica. Os elevados montantes de dívida pública acumulados na generalidade das economias europeias ocidentais comprometeram a sua sustentabilidade e restringiram decisões políticas, o que gerou repercussões tanto nos custos de financiamento soberano como no bem-estar social. Assim, diversos Estados Membros da Zona Euro foram forçados a implementar medidas mais restritivas de forma a conseguirem reduzir os seus desequilíbrios orçamentais, num cenário em que a política cambial se encontrava inacessível, e em que a taxa de inflação se apresentou especialmente baixa.

Neste contexto, a presente tese debruça-se sobre o impacto macroeconómico da política orçamental nos Estados Membros da UEM, averiguando como este poderá variar de

acordo com os instrumentos utilizados e com fatores intrínsecos de cada país, tendo em atenção tópicos relevantes que ainda não estão suficientemente explorados na literatura.

É ainda analisado se, e como, a política orçamental poderá ser manipulada de acordo com motivações eleitoralistas, nomeadamente se as evidências empíricas dão suporte às previsões do modelo de "despesa visível" de Rogoff, ou ao modelo de despesa pública direcionada. Por outras palavras, se um hipotético aumento de despesa estará associado a mais despesas correntes, ou se existirão investimentos direcionados para satisfazer as pretensões de grupos ou regiões específicas.

Num primeiro momento, foram calculados os valores dos multiplicadores orçamentais desde a criação da União Monetária. De acordo com os resultados obtidos, a despesa pública nos Estados Membros tem um impacto positivo sobre a atividade económica (multiplicador de 0,44), sendo o impacto maior perante menores níveis de endividamento soberano, recessões económicas e fases negativas do ciclo económico (hiato do produto negativo). Por sua vez, a receita fiscal apresenta valores negativos, compreendidos entre -0,11 e -0,55, podendo, no entanto, revelar um impacto expansionista em países com menores níveis de dívida pública.

Porém, nem sempre as políticas resultam nos resultados expectáveis. Foram estimadas elasticidades do consumo privado, face aos instrumentos orçamentais, durante o período de 1960-2017, de forma a aferir como as elasticidades variam perante episódios orçamentais (claras ações políticas, como expansões ou consolidações orçamentais). As evidências indicam que as transferências sociais poderão estar na origem dos efeitos não-Keynesianos da política orçamental, uma vez o consumo privado apresenta elasticidades negativas face às suas variações, durante períodos de consolidação.

Ainda, os episódios não-Keynesianos tornaram-se menos prováveis de serem observados após os países integrarem a Zona Euro, dado que os gastos em investimentos e as outras despesas deixaram de apresentar uma relação negativa com o consumo privado. Foi também observado que as transferências sociais aparentam ter um impacto mais recessivo durante consolidações, que aquele observado perante expansões ou na ausência de episódios orçamentais.

Utilizando uma abordagem alternativa para identificar consolidações orçamentais (abordagem narrativa), foi constatado que o consumo privado continua a exibir uma resposta não-Keynesiana a choques fiscais.

Por último, a política orçamental aparenta ainda ser sensível a fatores políticos. Durante anos eleitorais, os decisores políticos tendem a aumentar as despesas correntes e a diminuir o peso dos impostos diretos. Porém, a estratégia orçamental tem sofrido algumas alterações ao longo dos anos. Desde a Grande Recessão, os Estados Membros aparentam ter perdido a sua capacidade para manipular a despesa pública com objetivos eleitoralistas, e começaram a diminuir os impostos indiretos. Também, após os Estados Membros aderirem à UEM, os decisores políticos começaram a aumentar a carga fiscal dos seus países face a choques na taxa de juro, uma vez que perderam a capacidade de recorrer à política monetária.

Palavras-chave: Política orçamental; Multiplicadores orçamentais; Efeitos não-Keynesianos; Zona Euro; Ciclos orçamentais políticos

JEL: B22; D72; E12; E62; H62; H63

Abstract

The fiscal policy, through the management of public revenue and expenditure, is usually used by policy makers to influence economic activity, namely through the control of available income, the reallocation of resources, the supply of goods and services or the correction of market failures.

Following the Keynesian perspective, designed during the Great Depression (1930's), the effects of fiscal policy should vary over the stages of the business cycle and over fiscal instruments used, being more needed and effective during recessions. However, in some historical cases, the empirical evidence seems to contradict the theoretical predictions in the spirit of the Keynesian theory, giving rise to the so-called non-Keynesian effects of fiscal policy.

Therefore, the last Great Recession brought the effectiveness of fiscal policy back into debate in the economic literature. The high amounts of sovereign debt accumulated in the majority of the western European economies have been jeopardizing the sustainability of public debts, restricting political decisions, with repercussions on sovereign financing costs and on people's welfare. Thus, several Eurozone's Member States were forced to implement more restrictive policies in order to reduce their budgetary imbalances, in a scenario where the exchange rate policies are unavailable, and the inflation rate has been especially low.

In this context, this thesis focuses on the macroeconomic impact of fiscal policy on the Member States, assessing how it may vary according to the fiscal instruments used, and to country specific characteristics, taking into account some relevant topics not very explored yet in the literature.

It is also analysed whether, and how, the fiscal policy can be manipulated according to electoral motivations, namely if evidence supports the predictions of the Rogoff's "visibility expenditure" model or the Public expenditure targeting model, i.e., if the hypothetical expenditure increase will be associated with current expenditure, or if the capital expenditure will be used as a target to specific groups and locations.

Firstly, it was computed the value of fiscal multipliers since the creation of the currency union. According to the results, public expenditure in Member States has a positive impact on economic growth (multiplier of 0.44), with a bigger impact on the less indebted countries, facing economic recessions and negative output gaps. In turn, tax revenue has negative values, between -0.11 and -0.55, but it can reveal an expansionary impact in countries with lower levels of public debt.

However, policies do not always result in the expected results. Elasticities of private consumption to fiscal instruments were estimated during the period 1960-2017, to access how fiscal elasticities vary during fiscal episodes (clear policy actions, such as fiscal expansions or consolidations). Evidence indicates that social benefits may be a root of the non-Keynesian effects of fiscal policy, since private consumption shows negative elasticities facing social benefits' shocks, during periods of fiscal consolidation.

In addition, non-Keynesian episodes became less likely to be observed after countries joined the Eurozone, given that investment spending and other expenditures have lost their non-Keynesian role. It was also perceived that social transfers seem to be more contractionary in consolidations than in both expansions and in the absence of fiscal episodes.

Using an alternative approach to identify fiscal consolidations (narrative approach), it is seen that private consumption continues to exhibit a non-Keynesian response to tax increases.

Lastly, fiscal policy in the Eurozone countries appears to be sensitive to political factors. During election years, the incumbent Governments seem to increase current spending and to decrease the direct tax burden. However, the fiscal strategy has changed over the years. Since the Great Recession, Member States have lost their ability to manipulate the Government spending for electoral purposes and began to decrease the indirect tax burden. Furthermore, after countries joined the EMU, policy makers began to increase tax burden facing interest rate shocks, since they have lost the ability to use monetary policy.

Keywords: Fiscal policy; Fiscal multipliers; Non-Keynesian effects; Eurozone; Political budget cycles

JEL: B22; D72; E12; E62; H62; H63

Contents

List of tables

Chapter 2 - Fiscal Multipliers in the Eurozone: A SVAR Analysis

Appendices

Chapter 3 - Fiscal episodes in the EMU: Elasticities and non-Keynesian effects

Appendices

Chapter 4 - Political Budget Cycles in the Eurozone

Appendices

List of Figures

Chapter 2 - Fiscal Multipliers in the Eurozone: A SVAR Analysis

Appendices

Chapter 3 - Fiscal episodes in the EMU: Elasticities and non-Keynesian effects

Appendices

Chapter 4 - Political Budget Cycles in the Eurozone

1. Introduction

Described as a set of decisions and rules related to taxes, to government expenditure, and to decisions to allocate resources in both the public and private sector, the fiscal policy intends to influence the economic activity through people's income and consumption, providing incentives for economic decisions. However, the relevance of fiscal policy and the need for State intervention in the economic activity is not consensual, varying according to different economic perspectives.

The Keynesian perspective, designed during the Great Depression, assumes that a proportion of economic resources is unemployed, and a certain fraction of the population is liquidity constrained. Then, there would be a higher propensity to consume during an economic crisis, and a change in the available income should have a significant impact on aggregate demand, resulting in an economic stimulus. The impact of fiscal policy on aggregate demand and its consequent dynamic effect are called Keynesian multipliers, i.e., the ratio of a change in output to a unitary change in the fiscal balance.

Following this perspective, the fiscal policy should vary over the stages of the business cycle and over fiscal instruments used, being more needed and effective during recessions. However, in several historical cases, the empirical evidence seems to contradict the theoretical predictions in the spirit of the Keynesian perspective, giving rise to the so-called non-Keynesian effects of fiscal policy.

The last Great Recession brought the effectiveness of fiscal policy back into debate in the economic literature. When the crisis emerged, many countries adopted expansionist fiscal measures to stimulate their economies, hoping to create an impact on demand and limit job losses. Nevertheless, the policies' impact on the business cycle during the crisis

seemed to be uncertain, especially on the relative stabilizing effects provided by the variation on government spending and tax cuts.

In this context, despite the Stability and Growth Pact and its underlying rules designed to lead countries to save fiscal buffers (enabling the proper functioning of the automatic stabilizers - taxes and transfers - and to apply counter-cyclical policies), the high amounts of debt accumulated in the majority of the western European economies jeopardized the sustainability of public finances, restricting political decisions, with repercussions on sovereign financing costs and on people's welfare. Consequently, several Eurozone's Member States were forced to implement policies that are more restrictive in order to reduce their budgetary imbalances, in a scenario where the exchange rate policies are unavailable, and the inflation rate has been low.

Back to the creation of the Economic and Monetary Union (EMU), in order to provide fiscal robustness and stability, and to avoid this excessive debt accumulation, the Maastricht Treaty was signed, requesting a stringent supranational commitment. Thus, after 1992, there were a gradual loss of fiscal autonomy of the EMU member states, due to the debt-to-GDP and deficit-to-GDP criteria of 60% and 3%, which had to be met by the potential Member States before their accession to the EMU and be sustained afterwards.

However, despite the constraints imposed by the European Authorities, the average Eurozone debt-to-GDP ratio was never below the threshold, the balance-to-GDP criteria was rarely complied, and the pro-cyclical policies, i.e., fiscal expansions on positive output gaps or contractions on negative output gaps, were often observed. Therefore, facing this recurrent expansionary bias and eroding fiscal buffers, pro-cyclically austerity measures become unavoidable.

Among other reasons, the literature argues that this European deficit bias may come from opportunistically motivated electoral purposes, i.e. the existence of political budget cycles.

Democracy is an essential feature to provide political structures, and the existence of free and regular competitive elections incentives governments to be more efficient, weeding out incompetent politicians. However, despite the scrutiny and commitment given to the population, political parties, intending to renew their legitimacy, may have other goals during electoral periods. The political budget cycles theory describes how the policy maker might manipulate fiscal policy to influence his re-election probability.

Thus, this thesis intends to understand how fiscal policy might influence, and be influenced, by economic and political factors, throughout three chapters:

In the first chapter, titled "Fiscal Multipliers in the Eurozone: A SVAR Analysis", we computed the value of fiscal multipliers (for government primary expenditure, income and wealth taxes and for production and import taxes) in the Eurozone countries since the creation of the currency union, to understand how the effect of fiscal policy can vary according to the public debt level, the pace of economic growth, and the output gap.

According to the traditional analysis based on the Mundell-Fleming model, the fiscal multipliers are predicted to be close to zero in economies with floating exchange rates but is larger in economies that are part of a currency union. Furthermore, as the EMU countries were subject to large fiscal adjustments, the magnitude of the fiscal multipliers deserves special attention.

In chapter two, we observed the EMU countries during the period 1960-2017, discussing how to properly identify clear fiscal policy actions, and when the non-Keynesian episodes might have happened. We also estimated short- and long-run elasticities of private

consumption for fiscal instruments, to assess how fiscal elasticities vary during fiscal episodes and to find the roots of the non-Keynesian responses.

It is also presented a case study of one of the most mentioned episodes in the literature: Portugal during the 1980's. At the beginning of that decade, Portugal had persistent budget deficits, which were not completely offset by the expansionary impact of public expenditure, resulting in weak economic growth. This situation caused an increase in the level of indebtedness, accompanied by a period of high inflation and difficulties in external financing that led to the implementation of policies that are more restrictive and to sign the second program with the IMF. However, the period was coincident with a strong economic recovery.

The title of this essay is "Fiscal episodes in the EMU: Elasticities and non-Keynesian effects".

Lastly, the third chapter provides evidences of the electoral influence on fiscal policy in the Eurozone countries, namely on primary balance and on the budget composition. Using data from 1995-2017 and identifying election years, it was assessed its impact on fiscal instruments, controlling factors such as the EMU membership, the impact of the Great Recession, the debt level and the macroeconomic context.

In addition, the predictions of the Rogoff's "visibility expenditure" model and the Public expenditure targeting model were discussed, i.e., if the hypothetical expenditure increase will be associated with current expenditure, or if the capital expenditure will be used as a target to specific groups and locations.

The essay is called "Political budget cycles in the Eurozone".

2. Fiscal Multipliers in the Eurozone: A SVAR Analysis[1]

2.1. Introduction

According to the definition given by Spilimbergo et al. (2009), fiscal multipliers (or Keynesian's multipliers) can be defined as being the ratio of a change in output to a unitary exogenous change in the fiscal balance, which could be driven by a change in government expenditure, or tax revenue. This concept assumes that, according to the Keynesian theory, an increase in fiscal deficit stimulates the level of domestic consumption, as well as GDP and the State's revenue, generating a cyclical dynamic. In turn, given an improvement in the budget balance, a recessive impact on economic activity might be expected.

Batini et al. (2012) and Brinca et al. (2016) explain that the last Great Recession brought the multipliers back into debate in the economic research literature, and consequently, the effectiveness of fiscal policy (and its variation, depending on the time and space factors). When the crisis emerged, many countries adopted expansionist fiscal measures to stimulate their economies, hoping to create an impact on demand and limit job losses (Born et al. 2013; Zubairy 2014). Nevertheless, the impact of the crisis on the multiplier's

[1] Published: Afonso, A., Leal, F. (2019). "Fiscal Multipliers in the Eurozone: A SVAR Analysis", *Applied Economics*, 2019, 51 (51), 5577-5593.

values seemed to be uncertain, especially on the relative stabilizing effects provided by the variation on government spending and tax cuts (Ilzetzki et al., 2013; Zubairy, 2014; Spilimbergo et al., 2009). Firstly, the uncertainty and mistrust in the economy appear to have increased precautionary savings, thus reducing the marginal propensity to consume and consequently the size of multipliers. However, on the contrary, the de-leveraging process increased the number of liquidity-constrained agents and the accommodative behave of monetary institutions (with the short rates being close to zero), which may have a positive impact on multipliers. As a result, in the absence of clear stabilizing effects, when the financial crises became a sovereign debt crisis, there was a shift from expansionary to austerity policies.

According to the traditional analysis based on the Mundell-Fleming model, the fiscal multiplier is predicted to be close to zero in economies with floating exchange rates (where government spending generates pressure on interest rates, diminishing net exports due to currency appreciation and the increase of demand for money – thus offsetting the government spending's expansionist effect), but is larger in economies which are part of a currency union. Furthermore, as the EMU countries were subject to large fiscal adjustments, the magnitude of the fiscal multipliers in the case of EMU countries deserves special attention (Born et al., 2013). Based on these reasons, the following research is focused on the Eurozone countries since the creation of the currency union.

We contribute to the existing literature with new estimates for fiscal multipliers and with a new insight into how these multipliers change according to different types of policies or country-specific factors in an economic and monetary union. The time span also covers the global financial and economic crisis, where fiscal multipliers might have changed the respective magnitudes. In addition, we build on a literature review of the transmission channels, determinants, and values of the multipliers (for different periods and samples),

as well as its inherent theoretical perspectives. The EMU, as a whole, has not been extensively explored in the literature, which is especially relevant, considering the recent episodes of fiscal consolidation.

This chapter is organized as follows. Section 2.2 is literature review. Section 2.3 presents the methodology and data. Section 2.4 reports the empirical analysis and Section 2.5 concludes.

2.2. Literature

2.2.1. Theoretical Perspectives

In Samuelson and Nordhaus (2001), fiscal policy is described as being a set of decisions or rules related to taxes, to government expenditure, and to decisions to allocate resources in both the public and private sector, in order to influence peoples' income and consumption, and to provide incentives for economic decisions. However, the need for State intervention in the economic activity is not consensual, and it varies according to different economic perspectives.

From the Keynesian perspective, it is assumed that a certain proportion of economic resources is unemployed, and thus that a certain fraction of the population is liquidity-constrained or economically myopic. Accordingly, as agents are expected to have a higher propensity to consume, a change in their income or taxes should have a significant impact on aggregate demand, consequently leading to second round effects: the so-called Keynesian multipliers. As these policies stimulate both national consumption and income, hypothetically there is no effect on savings and on capital accumulation (Bernheim 1989). Following this perspective, the size of government spending should vary over the stages

of the business cycle, being more needed and effective during recessions than expansions, thus enhancing the need for policy activism to stimulate output during a deep recession. (Auerbach and Gorodnichenko, 2012).

The Neoclassical perspective assumes that economic agents plan their consumption over their life cycle, where fiscal deficits might change their projections and lead to shifting costs to future generations. As argued in Bernheim (1989), a positive consumption shock is expected to cause a decrease in savings, a stimulus for interest rates, and consequently, to crowding out private initiatives.[2]

Diamond (1965) defends that the effect of temporary deficits on the economic activity is expected to be small and perverse, thus changing agents' decisions. As households plan their consumption level for a long-term horizon, a marginal increment on their wealth level generates a limited impact on current consumption. If the fiscal stimulus is generated by a tax decrease, then the result is expected to be close to its counterfactual value, whereby a decrease in capital tax level would stimulate savings (due to a higher rate of return), and a decrease in labour income could induce an intertemporal substitution, leading to the same result (stimulates savings).

The neoclassical economists appear to neglect the importance of fiscal policy in mitigating market failures and the business cycle. However, as argued in Lucas (1973), beforehand government policies just used to solve market failures (such as unemployment), despite the effects of these troubles remaining fixed. In addition, the author is sceptical about the possibility of policy makers applying contractionary measures to promote counter-cyclical policies in order to mitigate cyclical fluctuations.

[2] It should be noted that, as demonstrated in the Hicks-Hansen model (IS-LM), as expansionist fiscal policies increase the demand for money, a synchronization with monetary policy makers may be requested. If the money supply is flexible, then the maintenance of interest rates could avoid an offset of fiscal multipliers.

For otherwise, once the economy is close to full-employment, real deficits would crowd out private expenditure and inflationary pressures would emerge (Bernheim 1989).

As argued by Blanchard and Perotti (2002), the Neoclassical theory differs from the Keynesian one essentially with regard to government spending, as, on several occasions, private consumption and GDP increased simultaneously with a decrease in government spending (non-Keynesian effects of fiscal policy). Whilst in the neoclassical model, a shock in government spending can only result in an increase in private investment if the shock is sufficiently persistent and taxes are sufficiently non-distortionary (as investment could fall otherwise), in a Keynesian model, investment increases if the accelerator effect prevails, and it falls if the effect of a higher interest rate prevails.

Finally, the Ricardian theory defends the existence of an inter-generational altruistic transfer system, where the level of consumption is determined according to agents' resources and their descendants (dynastic resources function). This perspective predicts that fiscal deficits shift payments to future generations and that households increase their savings to match the present discounted value of future taxes and expenditures, thus avoiding any effect on their offspring. Therefore, a fiscal shock does not have any real effect on economic activity (Bernheim 1989).

2.2.2. Fiscal Multipliers

2.2.2.1. Transmission Channels

In Brinca et al. (2016), it is shown that one of the main transmission channels between fiscal policy and economic activity – which is an important determinant of the value of fiscal multipliers – is the level of liquidity-constrained agents in the economy. When the

constraints are higher, the marginal propensity to consume increases, thus leading to an increase in the magnitude of the fiscal multiplier. In addition, high interest rates and an increase in the net present value of the fiscal shock can also be a liquidity factor, which results in a boost to the value of multipliers.

Regarding tax policy, Zubairy (2014) demonstrated that a decrease in labour taxes increases output, the number of hours worked, consumption, and investment level. That also generates a positive wealth effect, whereby the intra-temporal substitution effect leads to a rise in consumption and employment, due to a higher return from labour. The investment level is expected to increase due to the increase in the rate of capital return and its effects on labour supply.

If capital taxes decrease, this will also result in more hours worked and a rise in wages. The after-tax return on capital might rise, causing an increase in investment, and the intertemporal substitution will lead to a delay in consumption and to an increase in labour supply. The effect on consumption and labour on the equilibrium is not linear, as labour tax revenue would soon be increased to pay for the deficit incurred (Zubairy 2014).

According to Brinca et al. (2016), a more progressive tax system could reduce the multiplier by reducing restrictions on credit, although it could also increase the value of the multiplier through a lower holding of assets and its impact on interest rates (whereby less savings lead to higher interest rates). In addition, the results of these authors also showed that the impact of fiscal measures sharply increases in response to a decrease in the capital–output ratio. They defend that when the tax levels go up, the economy becomes poorer (with less capital), interest rate increase, and wage rates decrease.

On the expenditure side, the empirical evidence provided by Afonso and Sousa (2011) shows that a public spending shock tends to generate a small (positive) effect on GDP, a

quick fall in stock prices, and an increase in debt-financing costs. Zubairy (2014) argues that, in the face of an increase in public spending, an increase in demand gives firms an incentive to reduce their markups in order to achieve a larger customer base. This shift in markups could increase labour demand, wages, and output. In turn, higher wages can lead households to substitute leisure for consumption, thus offsetting the negative impact on wealth. In addition, an increase in interest rates would be the expected and an intertemporal substitution effect (which would have a negative impact on consumption), although this would be small. However, in a situation where government spending is financed by lump-sum taxes, households would face a decrease in wealth, which would consequently generate an impact on consumption and on the number of hours worked.

As argued by Zubairy (2014), monetary policy is crucial to determine the movements of interest rates, which in turn plays a role in how the economy reacts to fiscal shocks. A higher nominal interest rate increases the spending and capital tax's multipliers, whereas the labour tax multiplier decreases. The first two multiplier's cases can be explained as a higher value of nominal interest rate means that the monetary policy makers increased their real rates less rapidly, thus increasing the expansionary effects of fiscal measures. Although inflation has a limited effect on fiscal shocks, it has a larger (negative) effect on the labour tax multiplier. Labour tax cuts result in households increasing labour supply, which generates a fall in wages, and lower marginal costs result in a fall in inflation.

2.2.2.2. Determinants of Fiscal Multipliers

As defended by many authors (e.g. Zubairy 2014; Boussard et al. 2012), nonlinearity of multipliers facing different types of measures and conditions exist, according to their source of financing. According to Boussard et al. (2012), the main factors affecting the

multipliers can be grouped as: i) factors that lead households to base their consumption level on their current income (financial frictions); ii) the nature of the fiscal shock (credibility and duration); iii) the composition of the fiscal shock; iv) the structural features of each economy; v) monetary policies, and; vi) the exchange rate regime and the openness of the economy.

When assessing the determinants of the value of fiscal multipliers, both for high-income and developing countries, Ilzetski et al. (2013) realized that the value depends on the level of development of each country, where developing countries tend to have higher multipliers than the high-income ones, although with a less persistent effect. Regarding debt level, the result showed that with a range of sovereign debts over 60% of GDP, the multipliers were not statistically different from zero, and thus the fiscal stimulus could have a negative impact on long-run output. Barrel et al. (2012) found a 40–55% correlation (positive) between country size and the multipliers, whereby large economies are less open to imports than smaller economies, in spite of the bigger impact on interest rates.

According to the literature, the action of fiscal multipliers is greater if leakages are few (i.e. the stimulus generates less changes in savings or on spending and imports). In addition, with regard to liquidity constrains and wealth inequality, Spilimbergo et al. (2009) argued that multipliers are maximized in the following circumstances: if households demonstrate non-Ricardian behaviours; if the propensity to import is small (related to the dimension and openness of each economy); if the automatic stabilizers are small; and if the output gap is large. When unemployment is very low, the fiscal policy has limited overall effects.

With respect to the role of the level of openness, closed economies used to have long-run multipliers over the unity, whereas open economies can have negative multipliers in the

short and long run. There are two reasons behind this phenomenon: i) a country with a low trade level could have high tariffs or barriers to trade, ii) the economy may be too large, despite a country's high level of trade (where its openness level is a relative indicator). Both factors can affect the magnitude of the multiplier independently (Ilzetski et al., 2013), as the shock tends to spread to other economies through the trade market, where the degree of dependence of consumption on current income, and the speed of response (labour market flexibility) are crucial factors (Barrel et al. 2012). Nevertheless, with regard to the exchange rate regime, capital mobility can accommodate the exchange rate in order to maintain the rate in parity. In addition, an open economy has smaller spending multipliers than a tax-based one, as it is unable to adjust the exchange rate. Therefore, the higher the degree of openness of an economy, the lower the multiplier that is to be expected (Boussard et al. 2012).

Regarding the persistence of the measures, while temporary reductions in income taxes decrease the multiplier, the mistrust about fiscal sustainability (with an impact on risk premium) can have a strong effect – which trigger intertemporal reallocation (e.g. a decrease in investment tax credits for firms). In addition, permanent measures generate higher multipliers than temporary ones when focused on income, while the reverse is true when the measures are focused on prices (Spilimbergo et al. 2009).

However, Barrel et al. (2012) believes that permanent multipliers might be smaller than temporary ones, as they have a higher impact on long-term rates, and consequently generate a decrease in asset prices and investment.

Auerbach and Gorodnichenko (2012) point out the difference of the values between an expansion and a recession. The result predicts a larger multiplier in a recession (close to two) than in an expansion (close to zero). It could be argued that the value of the multiplier should be higher, as government spending is simultaneous with the economic recovery.

In addition, the impact of government spending on total employment seems to be higher during recessions (particularly in private sector employment).

However, the expenditure shock could stimulate inflation during expansions and generate deflationary responses during recessions. According to Batini et al. (2012), for countries in a recession (and facing high-risk premium on debt), a smooth and gradual consolidation is preferred to an aggressive austerity, in order to avoid an excessive recessive impact on output (which does not compromise the debt ratio).

Measuring the rigidity of labour market (using an index of protection of labour relations and another one for labour market regulation), Auerbach and Gorodnichenko (2012) found that output responses during recessions increase when the rigidity in the labour market is higher, which is consistent with the view that labour rigidity enhances the effectiveness of fiscal policy during recessions.

Corroborating these perspectives, in a study on OECD countries, Riera-Crichton et al. (2015) argued that while in recessions the spending multiplier is 0.73, during expansions the value stands at 0.09 (which is not significantly different from zero). Under countercyclical policies, this value is smaller during a boom, as the reduction in government spending is offset by increases in consumption and net exports, which, in turn, reduces inflationary pressures. On the other hand, during a recession, an increase would have a positive and statistically significant effect on output, as it would lead to an increase in consumption and investment, as net exports and inflation would tend to decrease (which is consistent with the Keynesian theory).

However, Riera-Crichton et al. (2015) also discovered that in many cases (44%) pro-cyclical policy measures (related to public expenditure) are observed, rather than countercyclical ones. As the economic response does not appear to be symmetric for both

types of policies, the authors found evidence that during recessionary periods, the long-run fiscal multiplier can achieve the value of 2.3. By computing the value of multipliers depending on the phase of the business cycle and the type of policy adopted, the authors found the following situations can occur: i) when there is a decrease in government spending during an expansion – the multiplier assumes the value of zero at any horizon; ii) in the case of an increase in government spending during an expansion – the multiplier is 1.13 (1.25 after 2 years); iii) with a decrease in government spending during a recession the multiplier is 0.76, and; iv) an increase in government spending during a recession leads to the multiplier having the value of 0.68 (2.28 after 2 years).

The value of fiscal multipliers also depends on the relationship between the fiscal mechanism used and the reaction of the private sector. In this context, in the literature, there seems to exist a crowding-in/crowding-out pattern effect of government spending and taxation. Blanchard and Perotti (2002) argued that private consumption is crowded out by taxation, and crowded in by government spending, which is difficult to reconcile with a neoclassical model, and is consistent with a Keynesian model. On the contrary, both government spending and taxation crowd out private investment, which implies a strong negative effect on private investment of a fiscal expansion, which is consistent with the neoclassical model. The root of this difference is based on the responses of investment to an increase in expenditure, which depends on the relative strength of the effects preceded by an increase in both output and interest rates, although in both theories increases in public spending and taxes have opposite effects on investment.

In Boussard et al. (2012) it is argued that fiscal shocks lead to crowding-out effects (due to the interest rates) and to a fiscal multiplier smaller than 1; however, if the stimulus is large enough, the multiplier can be close to 1, as the marginal product of capital and the investment compensate the decrease in consumption.

The choice between government spending or tax cuts was studied by Barrel et al. (2012), who said that multipliers generated by income taxes and benefits adjustments are small, as they can be offset by a temporary change in savings rate. The opposite occurs with spending cuts, where an impact on unemployment and on goods and services bought could be expected. Furthermore, in Boussard et al. (2012), it is argued that short-term multipliers are higher facing expenditure shocks rather than tax shocks, and that because of this, there is a fundamental trade-off between short-run pain and long-term gain. This issue can be compounded by price rigidities, as firms can easily respond to shocks in aggregate demand by changing output, rather than by changing prices.

According to Ilzetski et al. (2013), countries under predetermined exchange rate regimes used to have long-run multipliers higher than 1 (note that under the currency union, if private demand rises together with public demand, then the multiplier exceeds the unity, assuming that net exports remain unchanged) (Born et al., 2013). Under a flexible exchange rate, the multipliers are close to zero. The differences between responses to fiscal shocks are related to the degree of monetary accommodation. These results are consistent with the Mundell-Fleming model, especially the results related to the efficacy of fiscal policy. In Zubairy (2014), it is argued that responses of monetary policy makers shift the output from the steady state, which is important when determining movements of interest rates and when limiting the impact of spending shocks.

Concerning the speed of action of monetary policy, Barrel et al. (2012) studied the differences between the scenario where a monetary action takes place during the first year of a fiscal consolidation, and the scenario where the interest rate is fixed during the first year. A faster response would reduce the fiscal multipliers during the first three years but would raise the values during the subsequent ones. In addition, the authors realized that

at zero lower bound, interest rates could not fall, although output could fall by 0.1 p.p. more than during the counterfactual scenario.

The importance of the monetary policy reaction (by managing interest rates) is shown in Leeper et al. (2017), where the expected inflation in the Taylor Rule can explain about 10% of impact multipliers. The Keynesian liquidity trap can be crucial, as if nominal interest rates remain at zero lower bound, this should increase the spending multiplier to values well above that of unity. In addition, Minea and Mustea (2015) highlight the importance of a strong coordination regarding monetary policy to promote a higher cohesion, coordination, and consequently, a more effective fiscal policy (which is a reliable tool when facing an economic crisis).

Empirical studies on the Eurozone countries have shown that output positively responds to a positive shock in public spending. In Combes et al. (2014), both expenditure and tax multipliers seemed to be significantly different in those countries most affected by the Eurozone crisis (Greece, Italy, Portugal, and Spain), and these countries had a higher expenditure multiplier and a more Keynesian response to spending shocks.

Table 2.1 summarizes some of the values found in the literature for the fiscal multipliers.

Table 2. 1 – Multiplier values in the literature

Article	Sample	Period	Method	Shock	Signal	Control Factor	Impact Multiplier	Cumulative Multiplier
Combes et al (2016)	CEEC	1999-2013	PVMEC	Government Expenditure	+	:	0.09	0.21
					+	Low Income	0.11	0.22
					+	High Income	0.05	0.11
					+	Low Debt	0.1	0.28
					+	High Debt	0.06	0.1
					+	Low Openess	0.11	0.26
					+	High Openess	0.08	0.13
Combes et al (2014)	Eurozone	1999-2012	PVAR	Government Expenditure	+	:	≈0	0.26
				Taxes	-	:	0.25	1.85
				Government Expenditure	+	Crisis	0.09	1.26
				Taxes	-	Crisis	0.28	1.55
Riera-Crichton, Vegh and Vuletin (2014)	OECD	1986-2008	LSDV (linear local projections)	Government Expenditure	:	:	0.31	0.40
					:	Expansion	0.09	0.09
					:	Recession	0.73	1.25
					:	Extreme Expansion	≈0	≈0
					:	Extreme Recession	1.25	2.08
					+	:	0.49	1.36
					-	:	≈0	≈0
					+	Expansion	1.13	1.25
					-	Expansion	≈0	≈0
					+	Recession	0.68	2.28
					-	Recession	0.76	0.79
Zubairy (2014)	USA	1958-2008	DSGE	Government Expenditure	+	:	1.12	0.85
				Labor Tax	-	:	0.13	0.34
				Capital Tax	-	:	0.33	0.36
Ilzetzki et al (2013)	20 High-income 24 Developing	1960-2007	SVAR	Government Consumption	+	High-Income	0.37	0.80
					+	Developing	-0.21	0.18
					+	Predetermined Exchange Rate	0.09	1.50
					+	Flexible Exhange Rate	-0.30	≈0
					+	Open Econ.	0.02	1.29
					+	Closed Econ.	-0.28	-0.75
					+	High Debt	≈0	-2.30
				Government Investment	+	High-Income	0.41	1.15
					+	Developing	0.57	0.75
Auerbach and Gorodnichenko (2012)	OECD	1985-2008	SVAR	Government Expenditure	+	:	:	0.31
			Direct Projections		+	:	:	0.46
			Direct Projections (FE)		+	Expansion	:	-0.20
			Direct Projections (FE)		+	Recession	:	0.46
Barrel et al (2012)	OECD	2010-2012	NiGEM	Government Consumption	-	Temporary Innovations	-0.63	:
				Indirect Taxes	+	Temporary Innovations	-0.09	:
				Direct Taxes	+	Temporary Innovations	-0.14	:
				Government Consumption	-	Permanent Consolidation	-0.58	:
				Indirect Taxes	+	Permanent Consolidation	-0.08	:
				Direct Taxes	+	Permanent Consolidation	-0.12	:
Born, Jüben and Müller (2012)	OECD	1985-2011	SVAR	Government Expenditure	+	Fixed Exchange Rate	1.25	1.00
					+	Floating Exchange Rate	0.45	0.55
Blanchard and Perotti (2002)	USA	1960-1997	SVAR	Government Expenditure	+	:	0.84	1.29
				Taxes	+	:	-0.69	-0.78

Methodology and Data

As argued by Blanchard and Perotti (2002), the VAR approach may be one of the best-suited methods for the study of fiscal policy (contrary to monetary policy), for two reasons. First, fiscal variables move for several reasons, including many exogenous (with respect to output) fiscal shocks. Second, decision and implementation lags in fiscal policy imply that, at a high enough frequency, there is little or no discretionary response of fiscal policy to unexpected contemporaneous movements in economic activity. In a related study, Afonso et al. (2010) decomposed both government spending and government revenue into three components: responsiveness, persistence, and discretion, where discretion is not related to the business cycle and neither is it related to the autoregressive stickiness of the fiscal variables. Nevertheless, this approach does encompass the simultaneous response of all the variables in an SVAR set-up.

In order to assess the value of the multipliers from a shock in primary government expenditure and in tax revenue, we distinguished the taxes on Income and wealth and on Production and imports. All variables are presented in real terms, per capita, with logarithms and, with the exception of GDP, all the variables are presented with differences in respect to the unit root test. The estimation of the fiscal multiplier was based on the reduced-form VAR model, with four lags (which verifies the stability condition):

$$\mathrm{A(L)}Y_t = u_t. \qquad (1)$$

Y_t denotes a vector containing the output and the fiscal variables, A(L) is an autoregressive lag polynomial, and u_t represents a correlated error term. Next, the structural uncorrelated shocks ε_t were computed.

In this way, an SVAR model was designed using a recursive identification based on the Cholesky decomposition of the variance-covariance matrix of the reduced-form VAR shocks. The ordering in the SVAR, from the most to the least exogenous, is the following: Taxes on Income and wealth – Taxes on Production and imports – Primary expenditure – GDP, as presented in Blanchard and Perotti (2002). In this case, taxes have a direct impact on output, although they might also have a role of financing government expenditure. In turn, government expenditure has a contemporaneous impact on output, but not on tax revenue. Following a Cholesky matrix, the first-ordered shock does not react contemporaneously to any shocks in the system; however, the second one only reacts to the first shock, and so on. Non-zero restrictions were then introduced in the matrix to represent the sensitivity of taxes to changes in GDP, including tax elasticities (with the values of 1.1 for income and wealth taxes, and 0.9 for production and imports).[3] As the primary expenditure elasticity is almost null,[4] its value was not considered (zero-restriction).

The four-variable VAR model equation has the following form:

$$\begin{bmatrix} 1 & 0 & 0 & 1.1 \\ \alpha_{pTiT} & 1 & 0 & 0.9 \\ \alpha_{giT} & \alpha_{gpT} & 1 & 0 \\ \alpha_{yiT} & \alpha_{ypT} & \alpha_{yg} & 1 \end{bmatrix} \begin{bmatrix} u_t^{iT} \\ u_t^{pT} \\ u_t^{g} \\ u_t^{y} \end{bmatrix} \qquad (2)$$

where g denotes the government expenditures, *y* the output, *iT* is the Income and wealth taxes revenue, and *pT* the tax revenue on Production and imports.

The fiscal multiplier is then computed as an accumulated change in output to a quarterly variation in the fiscal variable,[5] by imposing a set of quarterly exogenous shocks (1 s.d.

[3] Based on Mourre and Princen (2015) and Wolswijk (2007).
[4] See Prince, Dang, and Botev (2015).
[5] For example, if the quarterly shock is 0.1 and the annual response is 0.06, then this would be equivalent to a shock of 1%, with a response of 0.6% (multiplier of 0.6).

innovation) and by assessing the response of GDP, as we assume that the multiplier is linear (i.e. it is not sensitive to the magnitude of the shock). The multiplier is thus calculated by $\frac{\sum_0^{t+3} \Delta y_t}{\sum_0^t \Delta(iT/pT/g)_t}$.

2.3. Estimation and Results

We used different country sample settings in the estimations to assess the value of the fiscal multipliers and also to understand how they may vary according to specific factors. For the baseline estimation for the period 2000Q1-2016Q4, the sample is composed of Eurozone countries (EA19) with a dummy variable to exclude the countries during the period when they did not belong to the EMU. In a second stage, a dummy for high levels of public debt is included, with a threshold of 60% of GDP, in order to split the countries between those with amounts under and above this value. The third stage focuses on GDP growth, in order to perceive how the multipliers could vary, depending on whether the countries are in an expansion or a recession. For simplification, the annual growth rate (the sum of all the quarters of each year) was considered, and a recession was understood to be an annual decrease in GDP. Finally, in a last estimation, a dummy was added for the output gap (gap between the current GDP and the potential GDP – using annual data from AMECO), thus differentiating countries with an output under and above their potential GDP. Appendix 2.7.1 provides the description of the data used.

We use a default size of 95% for the confidence interval. The graphical representations of the impulse response functions are presented in Appendix 2.7.2.

2.3.1. Baseline Estimation

According to the baseline results (in Table 2.2), the value of the primary expenditure (accumulated) multiplier is 0.44 when facing a quarterly shock, in the EA19 between 2000 and 2016. In other words, by proportion, in response to a quarterly exogenous shock in primary expenditure (of +1%), GDP is expected to increase by 0.44% at the end of the first year (4 quarters). Moreover, the value is predicted to increase to 0.62 at the end of the second year.

Table 2. 2– Multiplier estimations for the baseline sample

Fiscal Multipliers: +1 s.d. innovation shock			SVAR 4 lags
Variable	Characteristic	Period (quarters)	Multiplier
Primary Expenditure	:	4	0.44
Primary Expenditure	:	8	0.62
Income and Wealth Taxes	:	4	-0.11
Income and Wealth Taxes	:	8	-0.58
Production and Imports Taxes	:	4	-0.55
Production and Imports Taxes	:	8	-0.48

A 1% increase in Income and wealth taxes' revenue is supposed to have a recessionary impact on GDP of 0.11%, achieving 0.58% over 8 quarters.

Concerning an increase in Production and imports taxes' revenue, the multiplier is expected to be −0.55; however, on the contrary, the remaining shocks slightly decrease at the end of the second year (−0.48).

As primary expenditure is higher at the end of the second year (showing a stronger impact on GDP), this appears to be an effective tool for dealing with the business cycle, which could be explained by the direct impact on demand generated by an expenditure shock, whereas a Production and imports tax shock would be accommodated by (lower than 1) price-demand elasticity.

It should be noted that, with the exception of Production and imports taxes, all the Impulse Response Functions (IRF) are significantly different from zero, with a confidence interval of 95%, which proves the robustness of the sign of the responses. In addition, the confidence interval is narrow enough during the first year to provide a strong clue of its magnitude. However, as the confidence interval becomes too broad during the following quarters, our analysis focuses on the annual multiplier.

2.3.2. Debt-Dependent Estimation

We have also accounted for the level of the debt ratio, with a dividing threshold of 60%. When observing the results (see Table 2.3), in the case of countries with high levels of public debt, the primary expenditure multiplier is 0.29, the Income and wealth taxes multiplier is −0.26, and the multiplier for Production and imports taxes is −0.75.

Table 2. 3 – Multiplier estimations of the debt dependent sample

Fiscal Multipliers: +1 s.d. innovation shock			SVAR 4 lags
Variable	Characteristic	Period (quarters)	Multiplier
Primary Expenditure	Debt > 60%	4	0.29
Primary Expenditure	Debt < 60%	4	1.09
Income and Wealth Taxes	Debt > 60%	4	-0.26
Income and Wealth Taxes	Debt < 60%	4	0.26
Production and Imports Taxes	Debt > 60%	4	-0.75
Production and Imports Taxes	Debt < 60%	4	0.29

On the contrary, with countries with a public debt lower than 60% of GDP, primary expenditure seems to be greater than the unity at the end of the first year (1.09) and the tax multipliers seem to have positive signs. An Income and wealth taxes shock has a multiplier of 0.26, and Production and imports taxes have a value of 0.29. The confidence

provided by a better fiscal performance and by a stronger redistribution could be the root of this expansionary result.

Therefore, the expenditure multipliers seem to be higher in countries with lower levels of public debt – at least during the first year. This result is corroborated by the figures presented by Combes et al. (2016) who reached the same conclusion for Central and Eastern European countries.

Although the effect on long-term interest rates (Spilimbergo et al., 2009) and the propensity to consume (Brinca et al., 2016) are predicted to be higher under a liquidity constraint scenario, the negative effects generated by an excessive accumulation of debt, seems to partially offset the fiscal stimulus, especially on the risk premium (Reinhart and Rogoff, 2010).

2.3.3. Growth-Dependent Estimation

We then went on to consider the relevance of computing fiscal multipliers during recession periods. The results (see Table 2.4) show that the primary expenditure multiplier is higher during recessions than during expansions – achieving values above unity (1.51), which is corroborated by some of the literature which points to a higher effectiveness of public expenditure during recessions (e.g. Auerbach and Gorodnichenko, 2012; Combes et al., 2014). This could be understood to be due to a higher need for subsidies and transfers by agents who have a high propensity to consume. In addition, whereas during an expansion a hypothetical decrease in public expenditure is offset by the increase in consumption and net exports, during a recession, expenditure has a higher

effect on output, thus increasing consumption and investment, whereas net exports tend to decrease (Riera-Crichtion et al., 2015).

Table 2. 4 – Multiplier estimations of the growth-dependent sample

Fiscal Multipliers: +1 s.d. innovation shock			SVAR 4 lags
Variable	Characteristic	Period (quarters)	Multiplier
Primary Expenditure	Expansion	4	-0.17
Primary Expenditure	Recession	4	1.51
Income and Wealth Taxes	Expansion	4	-0.18
Income and Wealth Taxes	Recession	4	-1.75
Production and Imports Taxes	Expansion	4	-1.17
Production and Imports Taxes	Recession	4	0.07

The Income and wealth multiplier also shows a higher (negative) value during recessions, with a stronger impact (−1.75) on consumption and investment decisions.

Contrary to the previous multipliers, the Production and imports multipliers seem to generate a higher effect on GDP during expansions. Whilst the multiplier has value greater than unity in expansions (−1.17), it has an almost null impact (positive) during recessions. A positive shock for this type of taxes can represent a disincentive for private consumption, which means that a possible reason for this expansionary multiplier could be the macroeconomic effects provided by an external indebtedness deleveraging.

Nevertheless, supporting the Keynesian theory, the results (with the exception of Production and import taxes) show that the fiscal policy is more effective when applying countercyclical policies – i.e. by increasing expenditure and providing higher incomes during recessions, and by applying higher taxes during expansions (the recessive impact would be lower).

Nevertheless, it can be perceived in Table 2.3 and Table 2.4 that the impacts of quarterly expenditure shocks are substantially higher in less-indebted countries (at least during the

first year) and during recessions. This finding may call for a special attention to the risks of fiscal consolidations strategies (restrictive, pro-cyclical policies) based on expenditure cuts (which is sometimes inherent for indebtedness processes) and also to the relevance of a controlled debt level, providing a fiscal space to apply counter-cyclical measures.

2.3.4. Output Gap-Dependent Estimation

For further robustness, we considered the relevance of positive and negative output gaps. The results (in Table 2.5) show that in countries where outputs are above their potential GDP (i.e. when the output gap is positive), the primary expenditure multiplier is predicted to be very small (0.07). Regarding tax multipliers, the annual multipliers seem to be higher, where the multiplier of Income and wealth taxes is −0.52 and −0.44 for Production and imports taxes.

Table 2. 5 – Multiplier estimations of the output gap-dependent sample

Fiscal Multipliers: +1 s.d. innovation shock			SVAR 4 lags
Variable	Characteristic	Period (quarters)	Multiplier
Primary Expenditure	OutputGap > 0%	4	0.07
Primary Expenditure	OutputGap < 0%	4	0.20
Income and Wealth Taxes	OutputGap > 0%	4	-0.52
Income and Wealth Taxes	OutputGap < 0%	4	0.00
Production and Imports Taxes	OutputGap > 0%	4	-0.44
Production and Imports Taxes	OutputGap < 0%	4	0.08

On the other hand, countries with negative output gaps seem to have lower multipliers. The primary expenditure multiplier was 0.20, with both taxes having multipliers close to zero (which is positive for indirect taxes).

The estimation shows that the fiscal policy produces better results during 'bad times', when there is a need for State intervention to apply countercyclical measures, which are more effective.

Assessing the results of all the dependent estimations together, we can conclude that public spending is more effective during recessions/"bad times" and that financing public expenditure with indirect tax revenues (by making an effort to control the debt level) to apply counter-cyclical policies seems to be the optimal strategy.

2.4. Conclusions

According to the literature, the uncertainty and the non-linear responses of fiscal stimulus during the Great Recession brought the sign and magnitude of fiscal multipliers to the centre of the debate. Accordingly, this study aims to compute the value of fiscal multipliers, namely of government expenditure, Income and wealth, and Production and import taxes, in the Eurozone countries since the creation of the currency union. In addition, we also aimed to understand how these values vary according to the level of public debt, the pace of economic growth, and the output gap.

After discussing some contributions in the literature regarding fiscal multipliers and the underlying theories, we conclude that, according to our estimations, government expenditure had a positive effect on output during the period 2000–2016, with an annual accumulated multiplier of 0.44 (0.62 after two years). The tax multipliers presented negative signs, whereby the multipliers for Income and wealth and Production and import taxes, respectively, stood at −0.11 (−0.58) and −0.55 (−0.48).

Furthermore, for countries with high levels of public debt, the computed primary expenditure has a smaller multiplier (0.29 in our study). The Income and wealth tax

multiplier is −0.26, and for the Production and imports taxes, it is −0.75. On the other hand, for countries with public debt under 60% of GDP, the annual expenditure multiplier seems to be above the unity (1.09) and the tax multipliers seem to have positive signs. The difference between multipliers depending on the debt level could be related to the negative effects provided by an excessive accumulation of debt, namely on risk premium.

In addition, the primary expenditure multiplier seems to be higher during recessions than during expansions, achieving values above unity in the first year (1.51, compared with the slightly recessive multiplier during expansions of −0.17). This result could support the Keynesian theory, which reflects the effectiveness of automatic stabilizers and supports that fiscal policy is expected to be more effective when applying countercyclical policies (which is corroborated by Auerbach and Gorodnichenko, 2012; Combes et al., 2014). Regarding tax multipliers, while Income and wealth taxes seem to be recessive during recessions (with just a small impact during expansions), Production and imports taxes are recessive during expansions (and slightly positive during recessions).

Lastly, countries with negative output gaps presented a higher primary expenditure multiplier of 0.20 (0.07 when the output gap is positive) and almost null tax multipliers (−0.52 and −0.44 for direct and indirect taxes, for positive output gaps, respectively).

During the recent economic crisis, several countries were subject to stringent fiscal consolidations, whereby spending cuts and tax increases were applied to highly indebted countries that faced recession. Following our results, we can conclude that this may not be the best strategy to boost economic growth, as the response is expected to be recessive under these conditions. Furthermore, we find that primary expenditure is more effective during recessions and “bad times”, and that financing public spending with indirect taxes (in an effort to control the debt level) to apply counter-cyclical policies could be the optimal strategy.

2.5. References

Afonso, A., Agnello, L. and Furceri, D., (2010). "Fiscal policy responsiveness, persistence and discretion". *Public Choice,* 145, 503-530.

Afonso, A. and Sousa, R. M. (2011). "The Macroeconomic Effects of Fiscal Policy". *Applied Economics*, 44(34), 4439-4454.

Argimón, I., González-Páramo, J. and Roldán, J. (1997). "Evidence of public spending crowding-out from a panel of OECD countries." *Applied Economics*, 29(8), 1001-1010.

Auerbach, A. and Gorodnichenko, Y. (2012). "Fiscal Multipliers in Recession and Expansion", NBER Chapters, in: Fiscal Policy After the Financial Crisis, 63-98, NBER, Inc.

Barrel, R., Holland, D. and Hurst, I. (2012). "Fiscal Consolidation: Part 2. Fiscal Multipliers and Fiscal Consolidations", OECD Economics Department Working Papers, No. 933. Paris: OCDE.

Batini N., Callegari G., Melina G. (2012). "Successful Austerity in the United States, Europe and Japan", IMF Working Paper 12/190. Washington: IMF.

Bernheim, B. D. (1989). "A Neoclassical Perspective on Budget Deficits" *Journal of Economic Perspectives*, 3(2), 55-72.

Blanchard, O. and Leigh, D. (2013), "Growth Forecast Errors and Fiscal Multipliers", *American Economic Review,* 103(3), 117-120.

Blanchard, O. and Perotti, R. (2002). "An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output" *Quarterly Journal of Economics*, 117(4), 1329-1368.

Born, B., Jüssen, F., and Müller, G. J. (2013). "Exchange Rate Regimes and Fiscal Multipliers" *Journal of Economic Dynamics and Control,* 37(2), 446-465.

Boussard, J., Castro, F. and Salto, M. (2012). "Fiscal Multipliers and Public Debt Dynamics in Consolidations". *European Economy - Economic Papers 2008 – 2015,* 460.

Brinca, P., Holter, A. H., Krussel, P. and Malafry, L. (2016). "Fiscal multipliers in the 21st century" *Journal of Monetary Economics*, 77, 53-69.

Combes, J. L., Minea A., Mustea L., and Sow M. (2014). "The Euro and the Crisis: Evidence on Recent Fiscal Multipliers". *Revue d'Economie Politique,* 124(6), 1013-1038.

Combes, J. L., Minea, A., Mustea, L. and Yogo, T. (2016). "Output Effects of Fiscal Stimulus in Central and Eastern European Countries". *Post-Communist Economies*, 28(1), 108-127.

Diamond, P. (1965). "National Debt and Neoclassical Economic Growth." *American Economic Review,* 55, 1125-1150.

Ilzetski, E., Mendoza, E. G. and Végh, C. A. (2013). "How Big (Small?) are Fiscal Multipliers?". *Journal of Monetary Economics,* 60(2), 339-254.

Leeper E. M., Traum, N. and Walker, T. B. (2017). "Clearing Up the Fiscal Multiplier Morass". *American Economic Review*, 107(8), 2409-2454.

Lucas, R. (1973). "Some International Evidence on Output-Inflation Tradeoffs". *American Economic Review*, 63(3), 326-334.

Minea, A. and Mustea, L. (2015). "A fresh look at fiscal multipliers: one size fits it all? Evidence from the Mediterranean area". *Applied Economics*, 47(26), 2728-2744.

Mourre, G. and Princen, S. (2015). “Tax Revenue Elasticities Corrected for Policy Changes in the EU”. *European Commission Discussion Paper* No.18. Brussels: European Commission.

Prince, R., Dang, T. and Botev, J. (2015). “Adjusting Fiscal Balances for The Business Cycle: New Tax and Expenditure Elasticity Estimates for OECD Countries”. OECD Economics Department Working Papers No. 1275. Paris: OECD.

Reinhart, C. M. and Rogoff, K. S. (2010). "Growth in a time of debt." *American Economic Review* 100(2), 573-578.

Riera-Crichton, D., Végh, and Vuletin, G. (2015). “Procyclical and Coutercyclical Fiscal Multipliers: Evidence from OECD Countries”. *Journal of International Money and Finance,* 52, 15-31.

Samuelson, P. A. and Nordhaus, W. D. (2001). *Economics*, New York: McGraw-Hill Education.

Spilimbergo, A., Symansky, S. and Schindler, M. (2009). “Fiscal Multipliers” *IMF Staff Position Note*, SPN/09/11. Washington: IMF.

Wolswijk, G. (2007). “Short and Long-Run Tax Elasticities: The Case of the Netherlands”. *ECB Working Paper Series*, No.763. Frankfurt: ECB.

Zubairy, S. (2014). “On Fiscal Multipliers: Estimates from a Medium Scale DGSE Model”. *International Economic Review*, 55, 169-195.

2.6. Appendices

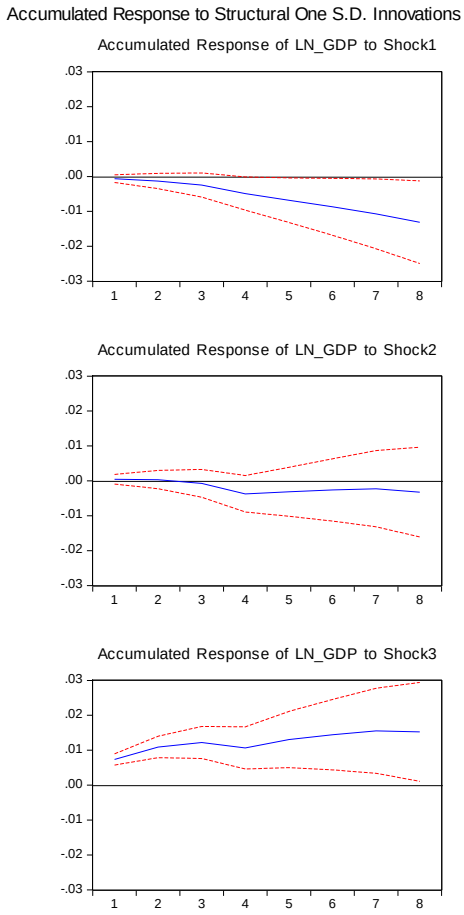
2.6.1. Descriptive Statistics

Table A 1 - Descriptive statistics of variables

	Mean	Median	Maximum	Minimum	Std. Dev.	Kurtosis	Observ.
GDP	25869.89	23243.31	83312.79	3157.75	15447.27	6.59	1292
Primary Expenditure	11001.61	9281.19	34560.62	694.56	6760.20	5.21	1256
Income and Wealth Taxes	3054.44	2285.14	12497.11	155.40	2353.46	5.89	1256
Poduction and Imports Taxes	3276.25	2913.73	10845.64	259.80	1917.74	6.58	1256
Debt	61.61	59.70	181.00	3.30	36.13	3.13	1289

2.6.2. Graphic Representation of the Estimations[6]

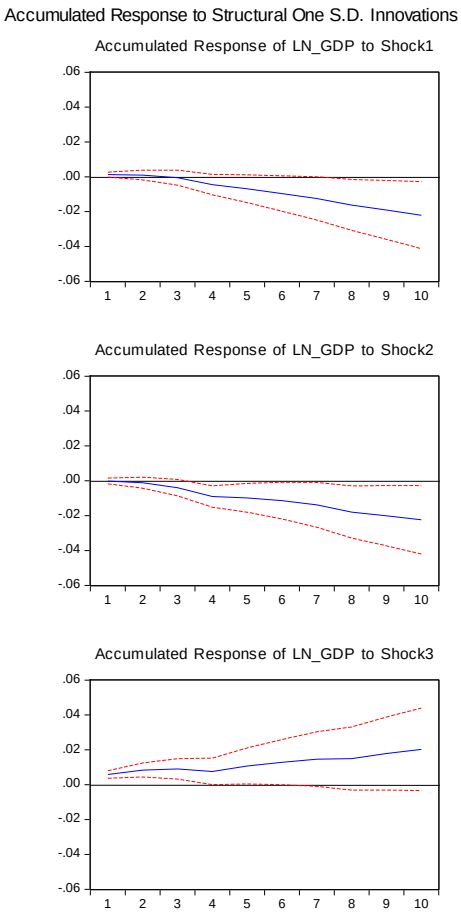
Figure A 1 - Baseline estimation



[6] Shock1: 1 S.D. innovation in the logarithm of Income and wealth taxes revenue (in differences); Shock2: 1 S.D. innovation in the logarithm of Production and imports taxes revenue (in differences); Shock3: 1 S.D. innovation in the logarithm of Primary Expenditure.

Figure A 2 - Debt-dependent estimation

Public Debt > 60% of GDP



Public Debt < 60% of GDP

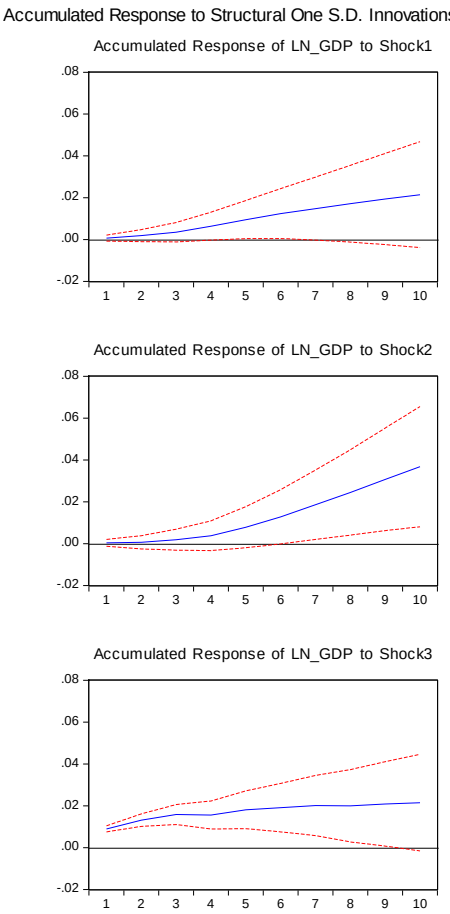
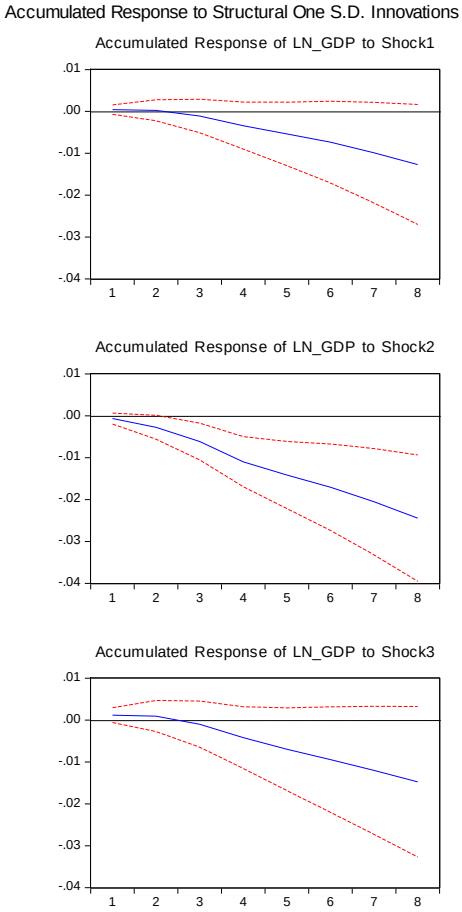


Figure A 3 - Growth-dependent estimation

GDP Growth > 0%



GDP Growth < 0%

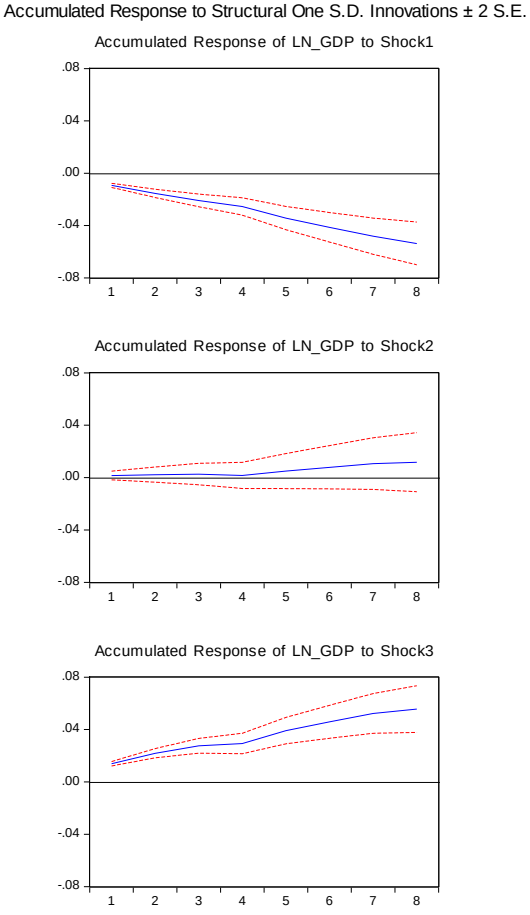
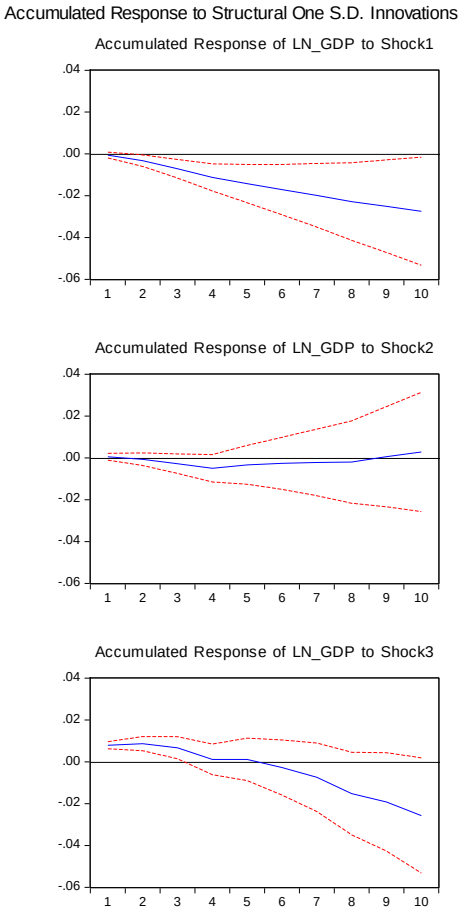
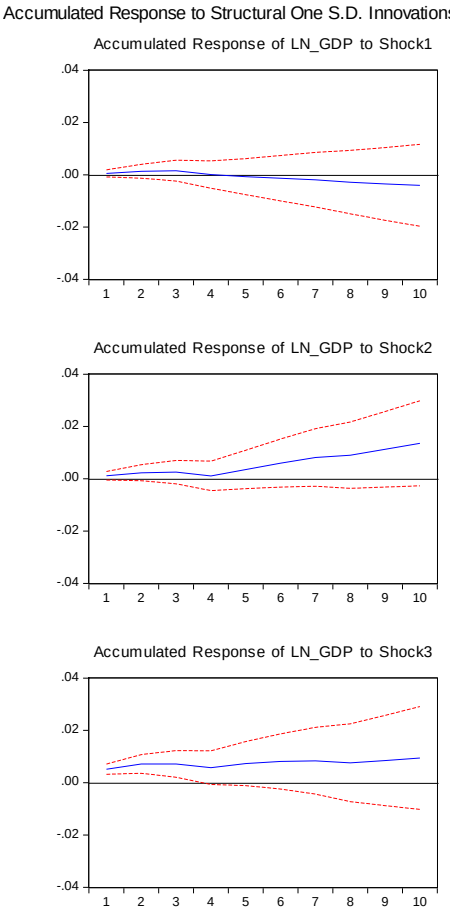


Figure A 4 - Output gap-dependent estimation

Output Gap > 0% Potential GDP

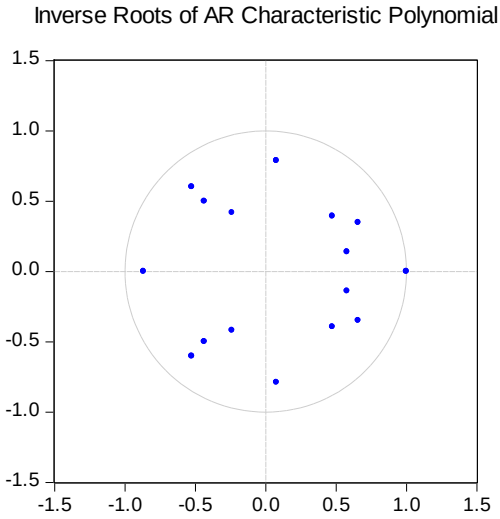


Output Gap > 0% Potential GDP

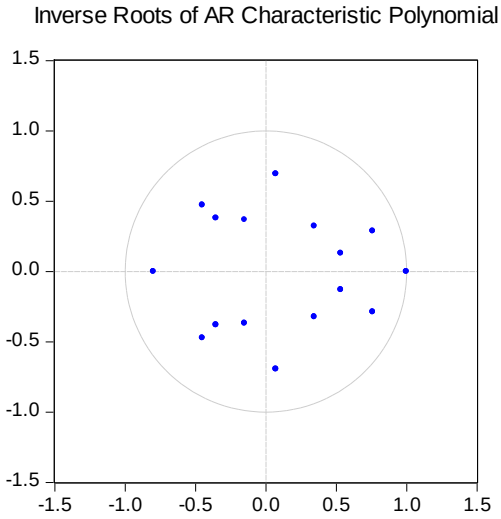


2.6.3. VAR Stability Condition Check

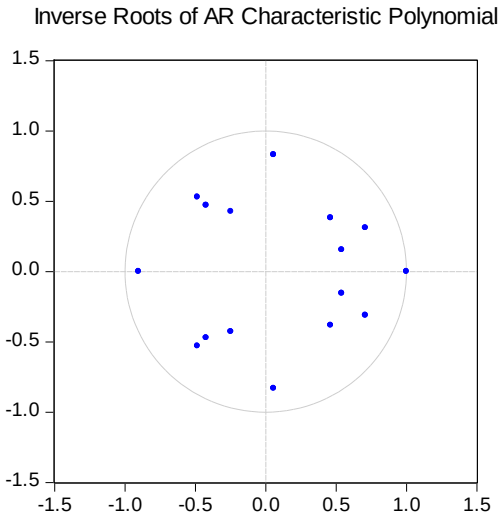
Figure A 5 - Roots of characteristic polynomial



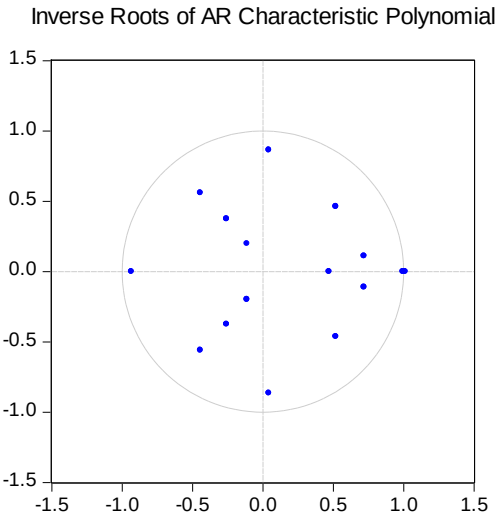
Baseline Estimation



Debt-Dependent Estimation (high)



Growth–Dependent Estimation (high)



Output Gap-Dependent Estimation (high)

3. Fiscal Episodes in the EMU: Elasticities and Non-Keynesian Effects[7]

3.1. Introduction

During the last decade, European countries implemented a large fiscal consolidation to reduce their budget deficits and government debt ratios. However, in several cases, the empirical evidence seems to contradict theoretical predictions, where fiscal consolidations are followed by an increase in output (e.g. Portugal during the 1980's). During the same period, there were also episodes where the symmetric effect occurred, i.e., in spite of stimulating the same GDP components, fiscal expansions led to recessive results. The literature labels such episodes as Non-Keynesian Effects of Fiscal Policy (NKEFP), despite the inexistence of either a consensus regarding the existence of a crowding in/crowding out effect induced by public expenditure, or the non-linearity of the macroeconomic impacts of fiscal policy. For instance, in the period 1960-2017 we find 81 fiscal expansionary episodes, 52 of which led to recessive economic outcomes[8].

The non-Keynesian effects of fiscal policy - more precisely the expansionary fiscal consolidations -, have encouraged research about the effectiveness of fiscal policy during

[7] Published: Afonso, A., Leal, F. S. (2020). "Fiscal episodes in the Economic and Monetary Union: Elasticities and non-Keynesian effects", *International Journal of Finance and Economics* 2020, 1–23.
[8] See detailed stylized facts, by date, in Tables 3.3 and 3.4.

the last few years, following the external interventions that occurred in the Eurozone, after the Global and Financial Crisis (GFC) of 2008-2009, which notably involved fairly demanding fiscal adjustments.

In this context, our aim is to specifically revisit fiscal instruments that may have a non-Keynesian effect on private consumption during fiscal episodes. In addition, we also contribute to the existing literature with new insights on some relevant topics not very explored yet, such as the fiscal episode's identification methods and the implications of the EMU membership on fiscal policy.

The chapter is organised as follows. Section 3.2 is the literature review. Section 3.3 methodologically identifies the discretionary fiscal episodes and the identification method. Section 3.4 presents the methodology, data, and the empirical assessment and, lastly, Section 3.5 concludes.

3.2. Literature Review

3.2.1. Keynesian Effects

Developed in the context of the Great Depression, the Keynesian theory focuses on the relevance of expenditure in the economy and in aggregate demand, namely its effects on inflation and output. In the Keynesian perspective, fiscal policy has an effective impact on aggregate demand (especially on national consumption and income) which passes through spillover effects (Bernheim, 1989). In order to advocate the stabilising function of fiscal policy, which emphasises the need for government intervention, this theory suggests that the size of government spending, together with the tax burden, should vary

according to the business cycle, namely through the application of automatic stabilizers (Auerbach and Gorodnichenko, 2012).

Following this approach, and by increasing government expenditure, the Government can have the ability to stimulate the labour market, induce private consumption, and encourage private investment. The theory assumes that a certain share of economic resources is not used, and that a proportion of the population is liquidity constrained or economically myopic, having a higher propensity to consume and respond quicker to an income shock (Brinca et al., 2016).

On the other hand, a fiscal adjustment (in the form of tax increases or cuts in public expenditure) would be expected to generate a temporary negative impact on aggregate demand, and consequently, on GDP. However, there is no consensus in the literature regarding the best instruments that should be used to implement a fiscal consolidation with the least possible economic cost. For instance, some authors, such as Afonso and Leal (2019), argue that government spending has a higher multiplier than that of increasing taxes, and Barrel et al. (2012) defend that multipliers generated by income taxes and benefits adjustments are small, as they can be offset by a temporary change in savings rate. Other authors, such as Alesina et al. (2017) defend that cuts in government spending and transfers seem to be less recessive than tax-based consolidations. In addition, Alesina et al. (2018) argue that spending cuts not only usually have a very small output cost, but they might even be expansionary in some cases.

Several studies[9] defend that fiscal impacts on output are substantially larger during recessions than during expansionary phases, as is the impact on total employment. Furthermore, such effect might be even higher if the spending shock is simultaneous with

[9] See, for example, Afonso and Leal (2019) or Stockhammer et al. (2019).

an economic recovery, despite the fact that this shock might generate deflationary responses during downturns (Auerbach and Gorodnichenko, 2012).

The level of government debt also plays a role in the multiplier effect of fiscal policy, due to the fact that the output response to a fiscal shock might not be statistically different from zero in countries with high debt ratios (say, above 60% of GDP). Accordingly, such a fiscal stimulus could have a neutral, or even negative impact on long-run output (Ilzetski et al., 2013).

Nevertheless, it seems relevant to highlight the fact that budget rigidities can constrain the ability of policy makers to properly implement fiscal policies, thus conditioning the size and structure of government budgets. According to Muñoz and Olaberria (2019), high shares of rigid spending in a budget contribute to the onset of fiscal distress. For instance, high expenditure on pensions reduces the probability of a fiscal consolidation, especially in countries with a lower level of institutional quality.

3.2.2. Non-Keynesian Effects

The effects behind the so-called non-Keynesian episodes are usually divided into those which are linked with the consumption channel, and those which are linked with the investment channel. With regard to the consumption channel, the hypothesis that a fiscal consolidation can increase private consumption assumes that non-Keynesian episodes occur due to expectations, wealth, and substitution effects.

The expectations' effect occurs when there is an improvement in the expectation of consumers regarding future tax liabilities, which can lead to a reduction in precautionary savings (Feldstein, 1982) and also to an increase in the present discounted value of

disposable income, which stimulates private consumption. The opposite also occurs when facing a deterioration of expectations, following the rationale of the Ricardian theory.

Regarding the wealth effect, a fall in interest rates, together with an increase in assets' market value and the opportunity cost of savings, all lead to households increasing their day-to-day consumption (McDermott and Wescott, 1996).

The substitution effect consists of the replacement of public consumption by private consumption. Under this perspective, a cut in government expenditure frees up more economic resources (such as the labour force) and increases the market space, creating room for the private sector to expand (Giavazzi and Pagano, 1990).

However, it is important to highlight that a fiscal consolidation can only stimulate private consumption if the impact is large enough to offset the direct effect on disposable income. In addition, should the reduction in public expenditure be small and temporary, then private consumption may not create an expansionist effect, due to a change in households' expectations regarding future budget deficits and debt dynamics (Afonso, 2001).

As argued by Barro (1974), with regard to inter-generational redistribution, the financing of bonds issued by present generations will be paid by the issue of new bonds, or through increases in the tax burden on future generations, thus compromising these generations' welfare.

Moving on to the investment channel, a fiscal consolidation can be expected to lead to an increase in private investment (Alesina et al., 1998). According to the literature, this investment can become the main source of expansionary consolidations, and it is one of the largest subjects for discussion regarding this issue. The first inherent effect is that of interest rates (consists of a sort of "credibility effect"), which assumes that a decrease in government budget deficits is followed by a decrease in the real interest rate, due to a fall

in the risk default premium[10] (Alesina et al., 1998). This reduction consequently leads to a boost in aggregate demand, through private demand, and generate incentives for private investment. Another situation where the interest rate effect can be observed is when there is a decrease of pressure from capital markets, as with lower budget deficits, governments have less financing needs.

The second inherent effect is on the labour market. Under certain conditions, fiscal consolidations can induce a wage moderation, which consequently leads to an increase in employment, to an improvement in economic competitiveness, followed by a stimulation of investment (Alesina and Perotti, 1997). According to Alesina and Perotti (1997), unit labour costs are the main factor behind expansionary fiscal consolidations. For whilst in a typical neoclassic model, labour supply depends on income and wealth effects, the authors defended that these effects are not so relevant. However, in a unionised labour market, increases in taxes can lead to strong increases in unit labour costs, reducing competitiveness. In this context, Carvalho (2009) found evidence that fiscal consolidations are highly probable to be successful if they are adequately combined with structural reforms.

In addition, regarding the composition of fiscal consolidations, Cournède and Gonand (2006) argued that consolidations based on tax increases reduce investment incentives and offset interest rate and labour market effects, whereas spending cuts and welfare payments are more likely to provide expansionary results. On the other hand, Sutherland (1997) argued that in the case of significant amounts of government debt, a tax increase

[10] According to Barbosa and Costa (2010), the risk premium depends on each issuer's idiosyncratic factors and corresponds to the return required by investors to offset the risk that future cash flows could be different from those agreed, due to the occurrence of a default.

could increase private consumption, and thus postpone the passing on of the costs of fiscal consolidation to future generations, thus discouraging private saving.

A few critical conditions are required to provide the possibility for an expansionary fiscal consolidation. The first is related to fiscal adjustment composition (as argued in the previous paragraph), where consolidations based on spending cuts have a higher hypothesis of stimulating output (Alesina and Perotti, 1995). Another condition is the initial state of public finances, where, as argued by Bertola and Drazen (1993), the policy effect depends on the expectations regarding future policies. According to Bertola and Drazen's model, in a difficult situation, a perception of improvement (due to cuts in public expenditure) increases consumption. However, the result is different if the spending cuts take place simultaneously with a tax increase.

The size and persistence of fiscal consolidation also plays a conditioning role, being a key factor for the success of the fiscal consolidation, i.e. by culminating in a reduction of the debt-to-GDP ratio (McDermott and Wescott, 1996). Giavazzi and Pagano (1996), when studying OECD countries, reported that the impact of changes in public consumption can have different results, according to both the size and persistence of fiscal consolidation. Whereas normal reductions in government consumption tend to lead to reductions in private consumption, if the shock is strong and persistent enough, this can cause the opposite effect. Furthermore, increases in transfers can also raise the level of private consumption, if those increases are persistent.

3.3. Empirical Results

In terms of the empirical results concerning the fiscal instruments behind non-Keynesian effects, Afonso (2010), using a fixed effects panel data strategy, realised that the long-run elasticity of private consumption is negative. In addition, a tax increase (during a fiscal consolidation) can have a positive impact on private consumption in the long run. In the case of social transfers, there is negative long-run elasticity (although only after the Maastricht Treaty signature).

Afonso and Jalles (2014) studied the elasticities for OECD countries with four different definitions of fiscal consolidation episodes. The results showed that lower government expenditure increases private consumption. Furthermore, private investment reveals a non-Keynesian response and social transfers have a negative impact on private investment.

With a similar specification, Afonso and Martins (2016) argued that, in fiscal consolidations, consumers do not demonstrate a Ricardian behaviour, and rather there is a positive short-run elasticity of private consumption to income and to general government final consumption, in line with the Keynesian theory. However, there is evidence of a non-Keynesian effect in the absence of a fiscal consolidation, with a positive short-run elasticity of taxes to private consumption. In addition, they report that Keynesian effects prevail when fiscal consolidations are not matched by monetary easing.

More recently, Arestis et al. (2018) studying the consequences of fiscal consolidations in several European countries realized that the effects of consolidations on employment produce mixed results, varying from country to country. In fact, they found evidences of a positive influence in Great Britain.

Table 3. 1 – Empirical results in the related literature: summary

Authors (year)	Methodology	Sample	Period	Main results
Giavazzi and Pagano (1996)	OLS / 2SLS	OECD (19 countires)	1970-2000	1. Transfers reveals a positive elasticity during "normal times"; 2. Facing fiscal episodes, taxes and government consumption have significant positive and negative impacts, respectively; 3. In both OLS and 2SLS methods, taxes and transfers appear to have non-keynesian effects on private consumption.
Miller and Russek (1999)	OLS Pooled Regression	OECD (19 countires)	1970-1996	1. There is some evidence of non-Keynesian effects; 2. Unusual fiscal contractions magnify the positive and negative effects of government spending and revenue on real private consumption spending.
van Aarle and Garretsen (2001)	OLS	EMU (14 countries)	1990-1998	1. The evidence for non-linearities in the effects of fiscal adjustments is limited during the transition period to the EMU; 2. There is no evidence of non-linearities in both taxation and transfers; 3. Government consumption has a positive influence on private spending;
		EU and non-EU	1970-2000	4. The effects of fiscal adjustments on private spending, with the possible exception of transfers, appear to have been relatively small.
Weyerstrass et al. (2006)	Fixed Effects	Finland, France, Ireland, Italy, Netherlands	1970-2005	1. Limited evidences of non-keynesian effects; 2. For higher debt levels, the impact of government spending on private consumption is much smaller; 3. The effects of government investment on private consumption display a pattern similar to the one of taxes (negative).
		EU (9 countries)	1977-2004	1. Similar results for the impact of tax changes facing low and high debt ratios; 2. Government spending has a positive impact on private consumption, while investment has a negative impact.
Afonso (2010)	Fixed Effects	EU15	1970-2005	1. The long-run elasticity of private consumption with respect to general government final consumption is negative; 2. A tax raise, together with a fiscal consolidation episode, could have a positive long-run effect on private consumption; 3. The long-run elasticity of social transfers is statistically significant and negative.
Afonso and Jalles (2014)	IV - GLS	OECD	1970-2010	1. Lower final government consumption increases private consumption; 2. There is some evidence of non-Keynesian effects for private investment.
Afonso and Martins (2016)	Fixed Effects	EMU (14 countries)	1970-2013	1. There is a positive relationship between general government consumption expenditure and private consumption; 2. Consumers are not behaving in a Ricardian way; 3. There is evidences of non-Keynesian effects in the absence of fiscal consolidations (tax-based).
Arestis et al. (2018)	Bootstrap Granger Causality	Portugal, Ireland, Italy, Greece, UK, Spain	1980-2014	1. There is no evidence that fiscal consolidation promotes growth; 2. Fiscal consolidation negatively affects employment in Portugal and Italy, whereas it positively influences employment in UK.
Cuestas and Ordóñez (2018)	SBVAR	EMU (9 countries)	2008-2014	1. Government expenditure contractions may be detrimental for employment; 2. Tax shocks do not seem to have a great impact on the response of unemployment.
Afonso and Leal (2019)	SVAR	EMU	2000-2016	1. Production and import taxes show a non-keynesian response in countries with: debts below 60% of GDP; negative output gaps, and during recessions; 2. Primary expenditure shocks might have negative effects on GDP during expansions.

Using a SVAR model, Afonso and Leal (2019) show that production and import taxes reveal a non-Keynesian response in countries with debt-to-GDP ratios below 60% of GDP

and during recessions. They also found evidence that primary expenditure shocks might have negative effects on GDP during expansions.

Table 3.1 provides a brief summary of the results for the macroeconomic effects of fiscal policy presented in various existing empirical analysis. Accordingly, when compared to previous studies, our paper provides an updated and more detailed analysis of fiscal elasticities, as well as insights into how the results may change following a different identification approach.

3.4. Identifying Fiscal Episodes

Appendix 3.8.1. reports the summary statistics of the variables. Our data set comes from the EC AMECO Database.

There are several ways to identify a fiscal episode, such as the implementation of clear policy actions (fiscal expansions or consolidations). When analysing the stance of fiscal policies, the literature highlights the structural balance, which results from the budget balance (in percentage of GDP or potential GDP), excluding cyclical and one-off effects. For the computation of the Cyclically Adjusted Balance (CAB), following the EU budgetary surveillance methodology, the CAB is derived as (Larch and Turrini, 2010):

$$CAB_t = BB_t - \varepsilon * OG_t, \qquad (1)$$

where, BB_t represents the nominal budget balance, OG_t the output gap (difference between the actual and potential output), and ε the budgetary sensitivity parameter. This parameter is calculated by aggregating the elasticities of individual revenue (η_R) and

unemployment-related expenditure ($\eta_{G,u}$), where they are weighted by the share of the total current taxes and total current primary expenditure, respectively (using the OECD and the European Commission Output Gap Working Group methodology). Thus, the difference yields the sensitivity parameter, as calculated by:

$$\varepsilon = \varepsilon_R - \varepsilon_G \qquad (2)$$

$$\varepsilon_R = \eta_R \frac{R}{Y} \;\; ; \quad \varepsilon_G = \eta_G \frac{G}{Y} \qquad (3)$$

where,

$$\eta_R = \sum_{i=1}^{4} \eta_{R,i} \frac{R_i}{R} \qquad \eta_G = \eta_{G,u} \frac{G_u}{G}. \qquad (4)$$

Whilst the IMF (1993) defines a fiscal episode as being a change of at least 1.5 p.p. in the structural balance during two consecutive years, other organisations, such as the OECD (1996), only considered variations above 3 p.p. in the structural balance. However, the structural balance might not be capable to capture all the changes in the economic environment, due to liquidity conditions, inflation, and consequently the effects in real interest rates. For this reason, the best indicator for measuring the discretionary orientation of fiscal policy is the structural primary balance, i.e., the structural balance, excluding interest payments.

Accordingly, when considering the structural primary balance, Alesina and Perotti (1995) identify fiscal episodes as being: i) years when the primary structural balance varies more than one standard deviation from the country average, or; ii) years when there is a change of at least 1.5 p.p. in the primary structural balance.

In our study, we consider the definition made by Alesina and Ardagna, (2010), where a fiscal episode, expansion (FE^E) or contraction (FE^C) occurs when there is a change of at least 1.5 p.p. in the cyclically-adjusted primary balance[11] (CAPB).

$$FE^E = \begin{cases} 1;\ \Delta CAPB \leq -1.5 \\ 0; \Delta CAPB > -1.5 \end{cases};\ FE^C = \begin{cases} 1;\ \Delta CAPB \geq 1.5 \\ 0; \Delta CAPB < 1.5 \end{cases}. \quad (5)$$

In practical terms, we need to be aware that a series break occurs in 1995, which represents the transition from the former definitions to the ESA 2010. For this reason, our estimations do not consider fiscal episodes that occurred during 1995. Table 3.2 reports all the fiscal episodes, based on the CAPB thresholds as defined in (5).

[11] We didn't use the primary structural balance due to the lack of data for one-off measures.

Table 3. 2 – Fiscal episodes by date, CAPB-based

Fiscal Episodes			
Country	**Expansionary** *ΔCAPB<-1.5*	**Consolidations** *ΔCAPB>1.5*	**Time-series**
Belgium	1972, 1976, 1980, 2003, 2005, 2009	1982, 1984, 2006	1966-2017
Germany	1995, 2001, 2010	1996, 2000, 2011	1991-2017
Estonia	1996, 1998, 2005, 2007-2008, 2011-2012	2009	1996-2017
Ireland	1974-1975, 1978, 1990, 2001, 2007-2010	1976, 1982-1983, 1988, 2000, 2003, 2011-2013	1970-2017
Greece	1975, 1981, 1985, 1988-1989, 1995, 2001, 2003-2004, 2006, 2008-2009, 2013, 2015	1982, 1986-1987, 1991, 1994, 1996, 2005, 2010-2011, 2014, 2016	1966-2017
Spain	2008-2009	1986, 1992, 1996, 2010, 2013	1971-2017
France	2009	1996	1971-2017
Italy	1972, 1981, 2000	1976, 1982, 1991-1993, 1997, 2007, 2012	1971-2017
Cyprus	2002, 2008-2009, 2014	2007, 2012-2013, 2015	1999-2017
Latvia	1998-1999, 2006	2009, 2011-2012	1998-2017
Lithuania	2007, 2011	1998-1999, 2010, 2012	1998-2017
Luxembourg	1979, 1986, 2002	1982-1983, 1985, 2005	1971-1987, 1996-2017
Malta	1996, 1998, 2003, 2008	1999, 2004, 2009, 2016-2017	1996-2017
Netherlands	1986, 2001, 2009	1977, 1991, 1993, 1996, 2013, 2016	1970-2017
Austria	1967, 1975, 2004	1984, 1997, 2001, 2005, 2015	1966-2017
Portugal	1971, 1972, 1974, 1978, 1980-1981, 1990, 1993, 1998, 2001, 2004, 2009-2010, 2014, 2017	1982-1983, 1986, 1992, 2002, 2006, 2011-2012, 2015-2016	1966-2017
Slovenia	2013	2012, 2014, 2015	1999-2017
Slovakia	2000, 2002, 2005-2006, 2009	1998, 2001, 2003, 2011, 2013	1998-2017
Finland	1978-1979, 1982, 1987, 1991, 2001, 2009-2010	1967, 1976, 1981, 1984, 1988, 1996, 1998, 2000	1966-2017
Total n.º of Years	82	98	

Source: Authors' calculations.

Still within this context, the IMF proposed an alternative approach to determine fiscal episodes. Indeed, Devries et al. (2011) present a dataset of fiscal consolidations based on a so-called narrative approach. These fiscal consolidation episodes were constructed based on policy documents, central banks reports, Converge and Stability Programmes submitted to the European Commission, and IMF and OECD reports.

Regarding this issue, Guajardo et al. (2014) criticised the CAPB approach as "*being imprecise and biased toward overstating the potential expansionary effects of fiscal adjustments*". Yang et al. (2015) tried to understand which approach is the most accurate

to analyse the macroeconomic effects of fiscal policy: either the one based on changes in the CAPB, or the narrative approach based on historical records of policy measures. These authors concluded that, although the narrative approach could be considered superior for identifying fiscal episodes correctly, the CAPB has the advantage of being much easier to implement and apply. These authors also argued that, contrary to the narrative approach, the empirical literature based on a CAPB approach supports the existence of non-Keynesian effects.

More recently, Gupta et al. (2018) updated the above-mentioned IMF database, by including observations up until 2015. Following this discussion, we made a comparison of the fiscal consolidations captured by our threshold and those identified in both Devries et al. (2011) and Gupta et al. (2018). It should be noted that the samples only have 10 countries in common during the period of 1978-2015. Table 3.3 compares the CAPB-based fiscal consolidation episodes with the so-called "narrative approach" consolidation episodes.

One can observe that the CAPB approach is more demanding than the narrative approach. For while the CAPB approach only captures 51 years of consolidation, the narrative one captures 131 (34.5% of the entire sample). Furthermore, we observe that only 34 fiscal consolidation episodes were identified simultaneously with both approaches. Since the more lenient requirements of the narrative approach can raise doubts about this approach's ability to effectively distinguish fiscal episodes from "normal times", we would argue that the traditional CAPB approach might be an appropriate method to pursue our study. Moreover, the use of a rule to determine fiscal episodes, based on the CAPB, also ensures a certain level of homogeneity across countries, although this is more difficult to carry out, based on economists' assessments of several different policy reports for the country sample.

Table 3. 3 – Comparison of approaches

Fiscal Consolidations			
Country	**CAPB Approach**	**Narrative Approach**	**Common Episodes**
Belgium	1982, 1984, 2006	1982-1985, 1987, 1990, 1992-1994, 1996-1997, 2010-2015	1982
Germany	1996, 2000, 2011	1982-1984, 1991-1995, 1997-2000, 2003-2004, 2006-2007, 2011-2012	2000, 2011
Ireland	1982-1983, 1988, 2000, 2003, 2011-2013	1982-1988, 2009-2015	1982, 1983, 1988, 2013-2015
Spain	1986, 1992, 1996, 2010, 2012	1983-1984, 1989-1990, 1992-1997, 2009-2015	1992, 1996, 2010, 2012
France	1996	1979, 1987, 1989, 1991-1992, 1995-1997, 1999-2000, 2011-2015	1996
Italy	1982, 1991-1993, 1997, 2007, 2012	1991-1998, 2004-2007, 2010-2015	1991-1993, 1997, 2007, 2012
Netherlands	1991, 1993, 1996, 2013	1981-1988, 1991-1993, 2004-2005, 2011-2013, 2015	1991, 1993, 2013
Austria	1984, 1997, 2001, 2005, 2015	1980-1981, 1984, 1996-1997, 2001-2002, 2011-2012, 2015	1984, 1997, 2001, 2015
Portugal	1982-1983, 1986, 1992, 2002, 2006, 2011-2012, 2015	1983, 2000, 2002-2003, 2005-2007, 2010-2015	1983, 2002, 2006, 2011-2012, 2015
Finland	1981, 1984, 1988, 1996, 1998, 2000	1992-1997, 2011	1997
Total n.º of Years	51	131	34

Source: Authors' calculations, and Devries et al. (2011) and Gupta et al. (2018).

In our next step, we consider as non-Keynesian episodes, those episodes where: i) the average real GDP growth during the two years after the fiscal contraction is greater than the growth during the previous two years (before expansionary consolidations), and; ii) real GDP growth during the two years after the expansion is smaller than the average growth during the previous two years (before recessive expansions). Table 3.4 presents these episodes.

One can conclude that, from the 81 years of fiscal expansion analysed (reported in Table 3.2), 52 of them led to recessive results. This can be explained by the application of not completely successful countercyclical policies, in an attempt to invert the business cycle. The beginning of the GFC is an example of this hypothesis, where during the period between 2007 and 2009, 19 of the 52 recessive fiscal expansions occurred. Additionally,

we identify expansionary fiscal consolidations in 45 of the 98 contractionary fiscal episodes (see Table 3.2 and Table 3.4).

In order to further illustrate this issue, in Appendix 3.8.3 we provide a case study analysis from Portugal - a small Euro Area open economy, which was subject to an international financial support programme in the aftermath of the GFC.

Table 3. 4 – Non-Keynesian episodes, by date

Non-keynesian episodes		
Country	**Recessive fiscal expansions**	**Expansionary fiscal consolidations**
Belgium	1980, 2009	1984, 2006
Germany	2001	2000, 2011
Estonia	1998, 2007, 2008, 2012	
Ireland	1974-1975, 1990, 2001, 2007-2009	1988, 2011, 2013
Greece	1981, 2004, 2008-2009	1994, 2014, 2016
Spain	2008-2009	1986, 1996, 2010, 2013
France	2009	
Italy	1981	1976
Cyprus	2002, 2008-2009	2007, 2015
Latvia	1998-1999	2011, 2012
Lithuania	2007	2010
Luxembourg	1979, 2002	1982-1983, 1985, 2005
Malta	1996, 1998, 2003, 2008	1999
Netherlands	1986, 2001, 2009	1977, 1993, 1996, 2013, 2016
Austria	1967, 1975	1997, 2005, 2015
Portugal	1972, 1974, 1980-1981, 1990, 1993, 2001, 2009	1986, 2006, 2015-2016
Slovenia		2014-2015
Slovakia	2009	2001, 2003, 2011
Finland	1982, 1991, 2001, 2009	1984, 1988, 1996
Total	52	45

Source: Authors' calculations.

3.5. Empirical Assessment

3.5.1. Baseline Results

Using annual data for the 19 Euro Area countries for the period of 1960-2017 (data sourced from the AMECO database), we estimate the short- and long-run elasticities of private consumption to fiscal instruments, using dummies to identify the fiscal episodes. We focus on understanding how the fiscal elasticities vary during fiscal consolidations (in comparison to "normal times") and try to find possible sources of non-Keynesian effects. A Wald coefficient test was used to access the differences between the presence and the absence of a fiscal consolidation.

Therefore, using a strategy based on Giavazzi and Pagano (1996), Alesina and Ardagna (1998), Afonso (2010) and Afonso and Martins (2016), we opted to use a Fixed Effects model to assess the impact of fiscal variables throughout time, assuming that the time-invariant characteristics are country-specific, which is a typical choice for this kind of study and is generally more adequate than the random effects model.

If the individual effects are a substitute for non-specified variables, it is probable that each country-specific effect is correlated with the other independent variables. Also, since the country sample includes all the EMU countries, and not a random sample from a bigger set of countries, the Fixed Effects model seems to be a suitable choice. Despite this, there are also several different appropriate methods that we could adopt, such as VAR models[12].

Furthermore, we carried out a redundant Fixed Effects Likelihood test for all the estimations, where the null hypothesis (no unobserved heterogeneity) was rejected.

[12] See Cuestas and Ordóñez (2018).

The baseline specification is modelled via the following reduced form regression:

$$\Delta Priv\_C_{it} = c_i + \lambda_1 Priv\_c_{it-1} + \lambda_2 \Delta Y_{it} + \lambda_3 Y_{t-1} + FE^C \text{ X } (\beta_1 \Delta Tax_{it} + \beta_2 Tax_{it-1} + \beta_3 \Delta ORev_{it} + \beta_4 ORev_{it-1} + \beta_5 \Delta CE_{it} + \beta_6 CE_{it-1} + \beta_7 \Delta GFKF_{it} + \beta_8 GFKF_{it-1} + \beta_9 \Delta Social_{it} + \beta_{10} Social_{it-1} + \beta_{11} \Delta OExp_{it} + \beta_{12} OExp_{it-1}) + (1 - FE^C) \text{ X } (\alpha_1 \Delta Tax_{it} + \alpha_2 Tax_{it-1} + \alpha_3 \Delta ORev_{it} + \alpha_4 ORev_{it-1} + \alpha_5 \Delta CE_{it} + \alpha_6 CE_{it-1} + \alpha_7 \Delta GFKF_{it} + \alpha_8 GFKF_{it-1} + \alpha_9 \Delta Social_{it} + \alpha_{10} Social_{it-1} + \alpha_{11} \Delta OExp_{it} + \alpha_{12} OExp_{it-1}) + \mu_{it}, \quad (6)$$

where *i* and *t* identifies the country and sample, *FE* is a dummy variable for fiscal episodes (consolidations in this specification) which assumes 1 in the case of a consolidation, and 0 otherwise. *Y* reflects the output, and the remaining variables represent several general government budgetary components: *Tax* – tax revenue; *ORev* – other revenue; *CE* – compensation to employees; *GFKF* – public investment; *Social* – social benefits; *OExp* – other expenditure. Furthermore, c_i is an autonomous term that captures countries' individual characteristics, and μ_{it} represents disturbances. The data is used as a natural logarithm of real per capita values and the unit root tests have proof the variable's stationarity. Table 3.5 presents the baseline results.

The first conclusion that we can make from Table 3.5 is that the cross-section fixed effects method is justified, as the result of the Redundant Fixed Effects Test rejects the null hypothesis. Accordingly, our analysis focuses on the first two columns of the output in Table 3.5.

Table 3. 5 – Baseline results, using fiscal consolidations (19 Euro Area countries)

Fiscal Consolidations								
ΔPriv_Ct								
			Country Fixed Effects		OLS		2SLS	
	C		-0.068**	(-2.463)	-0.069***	(-2.585)	0.039	(0.169)
λ_1	$Priv\_C_{t-1}$		-0.047***	(-3.465)	-0.049***	(-3.662)	-0.139***	(-2.813)
λ_2	ΔY_t		0.580***	(17.28)	0.579***	(17.03)	0.861***	(3.461)
λ_3	Y_{t-1}		0.000	(0.065)	0.002	(0.196)	0.099*	(1.707)
β_1	ΔTax_t		0.102	(1.548)	0.133***	(2.793)	0.310	(0.706)
β_2	Tax_{t-1}		0.040**	(1.985)	0.036**	(2.295)	0.002	(0.039)
β_3	$\Delta ORev_t$		-0.042***	(-2.875)	-0.012	(-1.256)	-0.063	(-0.476)
β_4	$ORev_{t-1}$		-0.004	(-0.835)	-0.001	(-0.231)	-0.018	(-0.561)
β_5	ΔCE_t		0.108	(1.466)	-0.038	(-0.819)	-0.318	(-0.495)
β_6	CE_{t-1}	x FE^C	0.020	(1.242)	0.003	(0.251)	-0.015	(-0.312)
β_7	$\Delta GFKF_t$		0.018	(1.238)	0.031**	(2.090)	0.042	(0.534)
β_8	$GFKF_{t-1}$		-0.005	(-0.689)	0.010*	(1.741)	0.005	(0.278)
β_9	$\Delta Social_t$		-0.150***	(-3.568)	-0.012	(-0.401)	0.054	(0.175)
β_{10}	$Social_{t-1}$		-0.012	(-1.027)	-0.021**	(-2.017)	-0.012	(-0.293)
β_{11}	$\Delta OExp_t$		-0.021	(-1.095)	-0.001	(-0.067)	0.073	(0.828)
β_{12}	$OExp_{t-1}$		-0.014	(-1.429)	0.001	(0.135)	0.035	(0.688)
α_1	ΔTax_t		0.107***	(3.987)	0.122***	(3.930)	-0.044	(-0.219)
α_2	Tax_{t-1}		0.030**	(2.465)	0.030**	(2.426)	0.031	(0.693)
α_3	$\Delta ORev_t$		-0.006	(-1.334)	-0.010*	(-1.864)	0.032	(0.586)
α_4	$ORev_{t-1}$		0.001	(0.408)	0.000	(0.226)	0.014	(0.424)
α_5	ΔCE_t		0.050**	(2.019)	0.109***	(3.918)	-0.099	(-0.745)
α_6	CE_{t-1}	x $(1-FE^C)$	-0.001	(-0.153)	-0.000	(-0.046)	-0.076	(-1.557)
α_7	$\Delta GFKF_t$		0.018***	(2.762)	0.012*	(1.840)	0.022	(0.411)
α_8	$GFKF_{t-1}$		0.005*	(1.685)	0.001	(0.303)	0.023	(1.119)
α_9	$\Delta Social_t$		0.015	(0.909)	-0.027	(-1.370)	0.195*	(1.864)
α_{10}	$Social_{t-1}$		-0.006	(-1.029)	-0.003	(-0.550)	0.032	(0.868)
α_{11}	$\Delta OExp_t$		0.020**	(2.075)	0.017	(1.610)	-0.003	(-0.067)
α_{12}	$OExp_{t-1}$		-0.000	(-0.136)	-0.000	(-0.012)	-0.025	(-1.080)
	N		703		703		414	
	R^2		0.719		0.705		0.700	
	Redundant FE Test		t-stat.	p-val.				
			1.94	0.01				

Note: The impacts are statistically significant at 1%, 5% and 10%, according to the classification ***, ** and * respectively (value of the t statistic in brackets).

List of instruments (2SLS) were based on Giavazzi and Pagano (1996): Lagged variables of all regressors, current change and lagged EA19 income, both interacted with year dummies.

Long-Run Elasticities			
$-\beta_2/\lambda_1$	Tax	x FE^C	0,85
$-\beta_4/\lambda_1$	ORev		-0,09
$-\beta_6/\lambda_1$	CE		0,43
$-\beta_8/\lambda_1$	GFKF		-0,11
$-\beta_{10}/\lambda_1$	Social		-0,26
$-\beta_{12}/\lambda_1$	OExp		-0,31
$-\alpha_2/\lambda_1$	Tax	x $(1-FE^C)$	0,65
$-\alpha_4/\lambda_1$	ORev		0,02
$-\alpha_6/\lambda_1$	CE		-0,04
$-\alpha_8/\lambda_1$	GFKF		0,12
$-\alpha_{10}/\lambda_1$	Social		-0,13
$-\alpha_{12}/\lambda_1$	OExp		-0,01

Wald Test		
Null Hypotesis	t-stat.	p-val.
$\beta_1-\alpha_1=0$	-0.07	0.95
$\beta_3-\alpha_3=0$	**-2.27**	**0.02**
$\beta_5-\alpha_5=0$	0.74	0.46
$\beta_8-\alpha_8=0$	-0.03	0.98
$\beta_7-\alpha_7=0$	-1.41	0.16
$\beta_9-\alpha_9=0$	**-3.77**	**0.00**
$\beta_{10}-\alpha_{10}=0$	-0.54	0.59
$\beta_{11}-\alpha_{11}=0$	**-1.89**	**0.06**

Comparing to the Ordinary Least Squares (OLS) output, during "normal times", the Country Fixed Effects model revealed very similar results in terms of both sign and magnitude. In addition, on the Two Step Least Squares (2SLS) estimation, one can observe that the majority of the fiscal variables appear to be statistically non-significant, where just the social benefits variations (positive) is significant at 10%.

Regarding short-run elasticities, "Tax revenue" (0.11), "Compensation to employees" (0.05), "Investment" (0.02), and "Other expenditure" (0.02) all have a statistically-significant expansionary effect during "normal times". Furthermore, when fiscal consolidations occur, only "Other revenue" (-0.04) and "Social benefits" (-0.15) appear

to have a significant (negative) impact on private consumption. In terms of long-run elasticities, both "Taxes" (0.65) and "Investment" (0.12) show significant effects on long-run private consumption during "normal times", while the "Tax revenue" budgetary item seems to have the only significant (0.85) elasticity when fiscal consolidations occur.

Applying the Wald Test (last panel in Table 3.5), we found that "Other revenue", "Social benefits", and "Other expenditure" all have statistically different short-term elasticities, with the worst impact occurring during fiscal consolidations. However, it is not possible to conclude that the budgetary item "Other expenditure" has a negative (different from zero) impact during consolidations.

Despite the fact that no major differences were observed in fiscal consolidation periods, the positive "Tax revenue" elasticity indicates that consumers are behaving in a Ricardian way, as they perceive a future increase in taxation to be a sign of future additional government spending.

As proposed by Blanchard (1990), the non-Keynesian response to a tax shock might also be interpreted as a reduction of uncertainty about future fiscal unbalances. If fiscal policy follows an unsustainable path, a tax hike may boost permanent income, as it reduces the risk of costly disruptions in the future.

These results are less in line with the findings of Alesina et al. (2017), where it is argued that cuts in government spending and in transfers are less recessive than tax-based consolidations. In fact, some evidences of non-Keynesian responses to tax shocks were perceived in several empirical studies, such as Giavazzi and Pagano (1996), Afonso (2010), or Afonso and Leal (2019).

Furthermore, the response of private consumption to "Social benefits" changes during fiscal consolidations could well be a source of non-Keynesian episodes (expansionary

consolidations), whereas cuts in expenditure stimulate private consumption. One can hypothesise that such behaviour might be a consequence of fiscal sustainability perceptions (related to ageing costs and debt management) and of hypothetical perverse incentives created by the attribution of social benefits during a long-time range. Nevertheless, as argued in Blanchard (1990), this hypothesis presupposes that the share of social benefit consumers is fairly small, and not myopic.

Another possible reason for the negative elasticity of "Social benefits" has to do with the propensity to save. As observed in several European countries during the GFC, the expected saving rates (related to precautionary reasons) broke the link between available income and the consumption level. Indeed, savings rates even increased. In addition, since strong pro-cyclical fiscal consolidations (episodes) occurred during the crisis, Social benefits increased, due to high unemployment levels being registered in parallel with other spending cuts that had the effect of reducing available income. Consumers could also perceive a substitution effect on private consumption, where the government replaces private sector expenses, or brings about an anticipation of future higher taxes to finance the current social transfers.

Comparing with previous empirical researches, the short-run elasticities presented in Table 3.5 are similar to Giavazzi and Pagano (1996), who realized that taxes and transfers appear to have non-Keynesian effects on private consumption. On the long-run elasticities, the results corroborate the main conclusions of Afonso (2010), where: i) the long-run elasticity of private consumption with respect to government spending is negative, ii) tax raises could have positive effects on private consumption during consolidations, and iii) the social transfers' elasticities are negative.

3.5.2. The Narrative Approach and CAPB

Following the discussion presented above, when considering the best approach to identify fiscal consolidation episodes, we repeat the baseline Fixed Effects estimation (Table 3.5), using the contractionary fiscal episodes identified in Devries et al. (2011) and Gupta (2018). Since the sample only covers 10 Euro Area countries (Belgium, Germany, Ireland, Spain, France, Italy, Netherlands, Austria, Portugal, and Finland) during the period of 1978-2015, we also re-estimated the baseline using the CAPB approach for this sub-sample, in order to provide a fair comparison (see Table 3.6).

According to Table 3.6, using the Narrative Approach to identify fiscal consolidations, both the short- and long-run elasticities of "Tax revenue" are statistically significant, as well as the short-run elasticities of "Other revenues", "Compensation to Employees", and "Other expenditure". During "normal times", not does the short-run, but the long-run elasticity of "Compensation to employees" becomes significant, as well as the short-run elasticity of "Investment".

The results also show that private consumption has a non-Keynesian response to a "Tax revenue" shock (positive) - both in the short and long-run, i.e., an increase in the tax burden appears to stimulate private consumption. In addition, contrary to what occurs during fiscal consolidations, an increase in "Other expenditures" seems to have a recessive impact during normal times.

Table 3. 6 – Comparison: narrative approach and CAPB (10 Euro Area countries)

Fiscal Consolidations

			ΔPriv_Ct			
			Narrative Approach		CAPB	
	C		-0,226***	(-4,378)	-0,213***	(-4,165)
λ_1	$Priv\_C_{t-1}$		-0,123***	(-5,473)	-0,113***	(-4,881)
λ_2	ΔY_t		0,410***	(9,851)	0,390***	(9,090)
λ_3	Y_{t-1}		0,020	(1,153)	0,014	(0,830)
β_1	ΔTax_t		0,123***	(2,888)	0,102	(1,122)
β_2	Tax_{t-1}		0,071***	(3,886)	0,094***	(3,957)
β_3	$\Delta ORev_t$		-0,018*	(-1,912)	-0,040**	(-2,435)
β_4	$ORev_{t-1}$		-0,002	(-0,762)	-0,008	(-1,253)
β_5	ΔCE_t		0,164***	(3,279)	0,099	(1,022)
β_6	CE_{t-1}	x FE^C	0,012	(0,951)	0,017	(0,919)
β_7	$\Delta GFKF_t$		0,015	(1,163)	0,045**	(2,148)
β_8	$GFKF_{t-1}$		-0,004	(-0,691)	-0,002	(-0,193)
β_9	$\Delta Social_t$		-0,064	(-1,574)	-0,232***	(-3,458)
β_{10}	$Social_{t-1}$		-0,012	(-1,224)	-0,029**	(-2,204)
β_{11}	$\Delta OExp_t$		0,023**	(1,999)	-0,041	(-1,427)
β_{12}	$OExp_{t-1}$		0,003	(0,469)	-0,008	(-0,587)
α_1	ΔTax_t		0,103***	(3,006)	0,146***	(4,587)
α_2	Tax_{t-1}		0,054***	(3,406)	0,063***	(4,094)
α_3	$\Delta ORev_t$		-0,009*	(-1,674)	-0,007	(-1,502)
α_4	$ORev_{t-1}$		-0,005	(-1,482)	-0,006**	(-2,144)
α_5	ΔCE_t		0,013	(0,701)	0,016	(0,874)
α_6	CE_{t-1}	x $(1-FE^C)$	0,029***	(2,757)	0,018*	(1,798)
α_7	$\Delta GFKF_t$		0,029***	(2,645)	0,032***	(3,676)
α_8	$GFKF_{t-1}$		0,003	(0,739)	0,003	(0,753)
α_9	$\Delta Social_t$		-0,024	(-1,107)	0,004	(0,189)
α_{10}	$Social_{t-1}$		-0,011	(-1,468)	-0,015**	(-2,213)
α_{11}	$\Delta OExp_t$		-0,030**	(-2,092)	-0,008	(-0,771)
α_{12}	$OExp_{t-1}$		0,004	(0,701)	0,005	(0,917)
	N		357		357	
	R^2		0,707		0,694	

Note: The impacts are statistically significant at 1%, 5% and 10%, according to the classification ***, ** and * respectively (value of the t statistic in brackets).

Long-Run Elasticities				
			Narrative Approach	**CAPB**
$-\beta_2/\lambda_1$	Tax	x FE^C	0,59	0,09
$-\beta_4/\lambda_1$	ORev		0,01	-0,05
$-\beta_6/\lambda_1$	CE		0,07	0,31
$-\beta_8/\lambda_1$	GFKF		-0,18	-0,05
$-\beta_{10}/\lambda_1$	Social		-0,40	0,03
$-\beta_{12}/\lambda_1$	OExp		0,07	-0,04
$-\alpha_2/\lambda_1$	Tax	x $(1-FE^C)$	-0,09	0,17
$-\alpha_4/\lambda_1$	ORev		-0,08	-0,03
$-\alpha_6/\lambda_1$	CE		0,20	0,11
$-\alpha_8/\lambda_1$	GFKF		0,15	0,02
$-\alpha_{10}/\lambda_1$	Social		0,06	-0,01
$-\alpha_{12}/\lambda_1$	OExp		0,11	0,02

Compared to the CAPB-based results, we can see that, under austerity policies, with the exception of the "Investment" and "Other revenue" budgetary items, the statistically significant variables have a non-Keynesian behaviour. Whilst public "Investment" seems to lead to a crowding in effect of private consumption, an increase in "Social benefits" has a negative impact on private consumption.

Furthermore, it is relevant to highlight that when using both approaches (which gives robustness to Table 3.5's output), and independently of the existence of a fiscal episode, the "Tax revenue" budgetary item presents an expansionary impact, which could well be justified by the expectation of a future increase in Government expenditure.

3.6. Robustness

Since, in the context of the EMU, exchange rate policies are unavailable and the inflation rate has been undoubtedly low, we aim to assess whether fiscal elasticities changed after countries joined the Euro Area. Furthermore, as the business cycle is highly influenced

by international factors (without strong barriers to capital, human, or capital circulation), we also take into account the role of economic (aggregate) growth in the EMU.

Accordingly, we divided the sample, using a dummy for the EMU that assumes the value of 1 for countries inside the Euro Area, and the 0 for countries not in the EMU. We also included the variable Y^{av}, which represents the natural logarithm of the (weighted) average of the EMU output per capita (after joining the Union) in order to control the European business cycle, as was performed by Afonso and Martins (2016).

Table 3.7 reports these estimation results. We can observe that the so-called non-Keynesian behaviour of both "Other expenditure" and "Investment" are no longer perceived after joining the EMU (which is probably related to a crowding out effect, were the reduction of expenditure leaves economic resources for the private sector, and diminishes the pressure on interest rates). Hence, after the EMU, it was harder to observe expansionary fiscal consolidations for these budgetary categories.

Table 3. 7 – Fiscal consolidations (controlling EMU membership)

Fiscal Consolidations								
					$\Delta Priv\_C_t$			
			EMU (Y_t-Y^{av}_t)		EMU		1-EMU	
	C		0.062	(0.692)	**-0.021**	**(-0.163)**	-0.084**	(-2.137)
λ_1	$Priv\_C_{t-1}$		-0.115***	(-4.845)	**-0.102*** **	**(-3.148)**	-0.048***	(-2.833)
λ_2	ΔY_t		0.424***	(5.823)	**0.335*** **	**(6.457)**	0.689***	(15.46)
λ_3	Y_{t-1}		0.067**	(2.168)	**0.020**	**(0.646)**	-0.005	(-0.285)
λ_4	$\Delta(Y_t$-$Y^{av}_t)$		0.081	(1.061)				
λ_5	Y_{t-1}-Y^{av}_{t-1}		0.000	(0.026)				
β_1	ΔTax_t		0.164*	(1.912)	**0.183***	**(1.734)**	0.104	(1.056)
β_2	Tax_{t-1}		0.020	(0.755)	**0.050**	**(1.289)**	0.023	(0.705)
β_3	$\Delta ORev_t$		-0.023***	(-3.370)	**-0.071*** **	**(-2.743)**	-0.023	(-1.308)
β_4	$ORev_{t-1}$		-0.001	(-1.191)	**-0.013**	**(-0.822)**	-0.001	(-0.228)
β_5	ΔCE_t		0.1177	(-0.097)	**0.142**	**(1.357)**	0.117	(1.084)
β_6	CE_{t-1}	x FE^C	0.005	(0.257)	**0.006**	**(0.224)**	0.048*	(1.852)
β_7	$\Delta GFKF_t$		0.045***	(2.704)	**0.047** **	**(2.451)**	-0.046*	(-1.755)
β_8	$GFKF_{t-1}$		0.011	(1.203)	**-0.000**	**(-0.032)**	-0.016	(-1.475)
β_9	$\Delta Social_t$		-0.195***	(-2.922)	**-0.146** **	**(-2.316)**	-0.195***	(-2.822)
β_{10}	$Social_{t-1}$		-0.004	(-1.068)	**-0.030**	**(-1.306)**	-0.004	(-0.256)
β_{11}	$\Delta OExp_t$		-0.069	(-0.605)	**0.015**	**(0.474)**	-0.069**	(-2.097)
β_{12}	$OExp_{t-1}$		-0.017	(-0.180)	**0.015**	**(0.742)**	-0.017	(-1.296)
α_1	ΔTax_t		0.186***	(5.193)	**0.263*** **	**(6.526)**	0.061*	(1.681)
α_2	Tax_{t-1}		0.049**	(2.313)	**0.064** **	**(2.268)**	0.039*	(1.956)
α_3	$\Delta ORev_t$		-0.010	(-0.447)	**-0.001**	**(-0.115)**	-0.010*	(-1.786)
α_4	$ORev_{t-1}$		0.007	(1.327)	**0.003**	**(0.270)**	-0.001	(-0.417)
α_5	ΔCE_t		0.0737	(-1.074)	**-0.021**	**(-0.473)**	0.073**	(2.300)
α_6	CE_{t-1}	x $(1\text{-}FE^C)$	0.0020**	(-2.282)	**-0.044***	**(-1.865)**	0.002	(0.125)
α_7	$\Delta GFKF_t$		0.033***	(3.911)	**0.026*** **	**(2.669)**	0.009	(1.021)
α_8	$GFKF_{t-1}$		0.021***	(3.225)	**0.015***	**(1.862)**	-0.000	(-0.168)
α_9	$\Delta Social_t$		0.039	(1.564)	**0.093** **	**(2.203)**	0.016	(0.849)
α_{10}	$Social_{t-1}$		-0.011	(-0.738)	**-0.013**	**(-0.827)**	-0.011	(-1.360)
α_{11}	$\Delta OExp_t$		0.019*	(1.687)	**0.012**	**(0.894)**	0.034**	(2.530)
α_{12}	$OExp_{t-1}$		0.0035**	(-2.156)	**0.005**	**(0.313)**	0.003	(0.508)
	N		428		**280**		423	
	R^2		0,789		**0,793**		0,720	
	Redundant FE Test		t-stat.	p-val.	**t-stat.**	**p-val.**	t-stat.	p-val.
			2,56	0,00	**2,10**	**0,01**	2,23	0,00

Note: The impacts are statistically significant at 1%, 5% and 10%, according to the classification ***, ** and * respectively (value of the t statistic in brackets).

Regarding "Social benefits", we find a negative elasticity both before and after the EMU, with a significate and expansionary (Keynesian) impact during "normal times" in the EMU.

Thus, since the non-Keynesian role of government spending is no longer perceived in the Eurozone countries, we believe that the expansionist consolidations became less likely to

observe. Among several reasons, that might be related to a possible incompatibility between the ECB's interest target and the exchange rate policy, some simultaneity of fiscal consolidations (which might hinder the increase of exports) and the value of fiscal multipliers, which seem to be higher facing fixed exchange rates, recessions and liquidity traps (Born et al, 2013; Afonso and Leal, 2019).

It is also relevant to refer that since the "EMU" subsample covers the Global and Financial Crisis, the Government spending on investment in several countries is significantly lower than in the period before, which might influence the sign and statistical significance of the elasticities. The results may also capture some differences in the public perception of fiscal policy in the post-Maastricht period.

In a last robustness estimation (Equation 7), we identified expansionary fiscal episodes as a way of assessing how fiscal consolidations are different from fiscal expansions, and also in order to achieve a more accurate "normal times" identification:

$$
\begin{aligned}
\Delta Priv\_C_{it} = {} & c_i + \lambda_1 Priv\_c_{it-1} + \lambda_2 \Delta Y_{it} + \lambda_3 Y_{t-1} \\
& + FE^C \text{ X } (\beta_1 \Delta Tax_{it} + \beta_2 Tax_{it-1} + \beta_3 \Delta ORev_{it} + \beta_4 ORev_{it-1} + \beta_5 \Delta CE_{it} \\
& + \beta_6 CE_{it-1} + \beta_7 \Delta GFKF_{it} + \beta_8 GFKF_{it-1} + \beta_9 \Delta Social_{it} + \beta_{10} Social_{it-1} \\
& + \beta_{11} \Delta OExp_{it} + \beta_{12} OExp_{it-1}) \\
& + FE^E \text{ X } (\alpha_1 \Delta Tax_{it} + \alpha_2 Tax_{it-1} + \alpha_3 \Delta ORev_{it} + \alpha_4 ORev_{it-1} + \alpha_5 \Delta CE_{it} \\
& + \alpha_6 CE_{it-1} + \alpha_7 \Delta GFKF_{it} + \alpha_8 GFKF_{it-1} + \alpha_9 \Delta Social_{it} + \alpha_{10} Social_{it-1} \\
& + \alpha_{11} \Delta OExp_{it} + \alpha_{12} OExp_{it-1}) \\
& + (1 - FE^C)(1 - FE^E) \text{ X } (\varphi_1 \Delta Tax_{it} + \varphi_2 Tax_{it-1} + \varphi_3 \Delta ORev_{it} \\
& + \varphi_4 ORev_{it-1} + \varphi_5 \Delta CE_{it} + \varphi_6 CE_{it-1} + \varphi_7 \Delta GFKF_{it} + \varphi_8 GFKF_{it-1} \\
& + \varphi_9 \Delta Social_{it} + \varphi_{10} Social_{it-1} + \varphi_{11} \Delta OExp_{it} + \varphi_{12} OExp_{it-1}). \qquad (7)
\end{aligned}
$$

In Table 3.8, we can observe that, in the case of fiscal expansions, “Taxes” and “Investment” are significantly expansionary, both in the short (0.14 and 0.03, respectively) and in the long run (0.74 and 0.23), and also that “Social benefits” have a negative long-run elasticity (-0.44). Once again, “Social benefits” show a negative elasticity (-0.15) in the context of fiscal consolidations.

Table 3. 8 – Fiscal consolidations and expansions

Fiscal Episodes				
			$\Delta Priv\_C_t$	
	C		-0.066**	(-2.384)
λ_2	$Priv\_C_{t-1}$		-0.048***	(-3.532)
λ_3	ΔY_t		0.569***	(15.73)
λ_4	Y_{t-1}		0.001	(0.167)
β_1	ΔTax_t	x FE^C	0.106	(1.598)
β_2	Tax_{t-1}		0.039*	(1.961)
β_3	$\Delta ORev_t$		-0.042***	(-2.880)
β_4	$ORev_{t-1}$		-0.004	(-0.922)
β_5	ΔCE_t		0.108	(1.460)
β_6	CE_{t-1}		0.019	(1.213)
β_7	$\Delta GFKF_t$		0.017	(1.219)
β_8	$GFKF_{t-1}$		-0.005	(-0.769)
β_9	$\Delta Social_t$		-0.152***	(-3.610)
β_{10}	$Social_{t-1}$		-0.011	(-0.982)
β_{11}	$\Delta OExp_t$		-0.022	(-1.111)
β_{12}	$OExp_{t-1}$		-0.013	(-1.351)
α_1	ΔTax_t	x FE^E	0.137***	(2.869)
α_2	Tax_{t-1}		0.035**	(2.210)
α_3	$\Delta ORev_t$		-0.012	(-1.250)
α_4	$ORev_{t-1}$		-0.001	(-0.276)
α_5	ΔCE_t		-0.042	(-0.920)
α_6	CE_{t-1}		0.006	(0.389)
α_7	$\Delta GFKF_t$		0.031**	(2.107)
α_8	$GFKF_{t-1}$		0.010*	(1.799)
α_9	$\Delta Social_t$		-0.016	(-0.540)
α_{10}	$Social_{t-1}$		-0.021**	(-2.047)
α_{11}	$\Delta OExp_t$		-0.003	(-0.196)
α_{12}	$OExp_{t-1}$		0.000	(0.042)
ϕ_1	ΔTax_t	x $(1-FE^C)$ x $(1-FE^E)$	0.124***	(3.362)
ϕ_2	Tax_{t-1}		0.028**	(2.141)
ϕ_3	$\Delta ORev_t$		-0.005	(-0.759)
ϕ_4	$ORev_{t-1}$		0.000	(0.279)
ϕ_5	ΔCE_t		0.082**	(2.570)
ϕ_6	CE_{t-1}		-0.003	(-0.322)
ϕ_7	$\Delta GFKF_t$		0.011	(1.458)
ϕ_8	$GFKF_{t-1}$		0.003	(0.833)
ϕ_9	$\Delta Social_t$		0.003	(0.142)
ϕ_{10}	$Social_{t-1}$		-0.002	(-0.457)
ϕ_{11}	$\Delta OExp_t$		0.028*	(1.670)
ϕ_{12}	$OExp_{t-1}$		0.001	(0.334)
	N		703	
	R^2		0.726	
	Redundant FE Test		t-stat.	p-val.
			1.77	0.03

Fiscal Consolidations		
Long-Run Elasticities		
$-\beta_2/\lambda_1$	Tax	0,82
$-\beta_4/\lambda_1$	ORev	-0,09
$-\beta_6/\lambda_1$	CE	0,41
$-\beta_8/\lambda_1$	GFKF	-0,12
$-\beta_{10}/\lambda_1$	Social	-0,24
$-\beta_{12}/\lambda_1$	OExp	-0,28

Fiscal Expansions		
Long-Run Elasticities		
$-\beta_2/\lambda_1$	Tax	0,74
$-\beta_4/\lambda_1$	ORev	-0,03
$-\beta_6/\lambda_1$	CE	0,13
$-\beta_8/\lambda_1$	GFKF	0,23
$-\beta_{10}/\lambda_1$	Social	-0,44
$-\beta_{12}/\lambda_1$	OExp	0,01

Wald Test		
Consolidations vs Expansions		
Null Hypotesis	t-stat.	p-val.
β_1-α_1=0	**1.64**	**0.10**
β_3-α_3=0	**-1.66**	**0.10**
β_5-α_5=0	**1.71**	**0.09**
β_7-α_7=0	-0.64	0.52
β_8-α_8=0	**-1.82**	**0.07**
β_9-α_9=0	**-2.67**	**0.01**
β_{10}-α_{10}=0	0.68	0.50
Consolidations vs Normal Times		
Null Hypotesis	t-stat.	p-val.
β_1-ϕ_1=0	-0.25	0.80
β_3-ϕ_3=0	**-2.32**	**0.02**
β_5-ϕ_5=0	0.32	0.75
β_9-ϕ_9=0	**-3.40**	**0.00**
β_{11}-ϕ_{11}=0	**-1.96**	**0.05**
Expansions vs Normal Times		
Null Hypotesis	t-stat.	p-val.
α_7-ϕ_7=0	1.17	0.24
α_8-ϕ_8=0	-0.07	0.94
α_{10}-ϕ_{10}=0	**-1.81**	**0.07**
α_{11}-ϕ_{11}=0	-1.41	0.16

Note: The impacts are statistically significant at 1%, 5% and 10%, according to the classification ***, ** and * respectively (value of the t statistic in brackets).

By double-checking the Wald Test again, we find that: i) in the short run, "Other revenue" and "Social benefits" are more recessive during consolidations than during expansions, and that "Taxes" and "Compensation to employees" have a more expansionary effect.

Furthermore, the "Other revenue", "Social benefits" and "Other expenditure" items are more recessive during fiscal consolidations than during "normal times" (which corroborates our first estimation results), and; ii) in the long run, "Investment" has a more recessive impact on private consumption during consolidations than during expansions, and "Social benefits" are more recessive in expansions than during "normal times".

Thus, according to the three sets of estimated specifications, we can argue that "Social benefits" could also be the source of long-term non-Keynesian effects during fiscal expansions, albeit with a smaller magnitude than during consolidations.[13]

As perceived by Afonso (2010), when a fiscal expansion episode takes place one can notice that the effect of taxes on private consumption is still, which does not seem to support the idea of clear asymmetric consumer behaviour. The results are also similar regarding the absence of a fiscal consolidation, where one can see that government final consumption has mostly no impact on private consumption.

3.7. Conclusions

We studied the relevance of a series of fiscal instruments for the existence of varying fiscal elasticities, in other words, for the existence of possible non-Keynesian effects, on private consumption during fiscal episodes. Accordingly, we estimated short- and long-run elasticities of private consumption to budgetary components, using dummy variables to identify fiscal episodes and also as a way of differentiating countries inside and outside the EMU. For the empirical analysis, we used a Fixed Effects model, covering 19 Euro Area countries during the period of 1960-2017.

[13] Appendix 3.9.2. provides a summary of short-term elasticities for a better understanding and comparison of results.

The results show that the budgetary categories “Tax revenue”, “Compensation to employees”, “Investment”, and “Other expenditure” all have a short-run expansionary effect during “normal times”. On the other hand, in the context of fiscal consolidations, the “Other revenue” and “Social benefits” items have significant (negative) impacts. The positive “Tax revenue” elasticities indicate that consumers are Ricardian, since they take into account in their decisions the likely increase in taxation as being a sign of future government spending.

In terms of estimated long-run elasticities, both “Taxes” and “Investment” have significant positive effects during so-called fiscal “normal times”, while “Tax revenue” seems to have a statistically-significant elasticity when a fiscal consolidation occurs.

Using a narrative approach (instead of the traditional CAPB) to identify fiscal consolidations, private consumption continues to exhibit a non-Keynesian response to tax increases, both in the short and long-run, and “other expenditures” seems to have a recessive impact during “normal times”.

Furthermore, since the non-Keynesian behaviour of both “Other expenditure” and “Investment” was no longer perceived after joining the EMU, we can argue that expansionary fiscal consolidations became more difficult to observe after the EMU.

Lastly, when comparing short-run elasticities during fiscal expansions, “normal times”, and during fiscal contractions, both “Other revenue” and “Social benefits” are more recessive during consolidations than during expansions and “normal times”. Furthermore, “Taxes” and “Compensation to employees” demonstrate more expansionary elasticities during fiscal consolidations than in the case of fiscal expansions.

According to our main results, the “Social benefits” budgetary component appears to contribute the most to the creation of a non-Keynesian effect, and it is possible to

conclude the existence of expansionary fiscal consolidations, with varying fiscal elasticities. Furthermore, “Social benefits” could well be a source of long-term negative responses of private consumption when fiscal expansions take place, albeit with a smaller magnitude than during fiscal consolidations.

Following our conclusions, we could be led to think that for further consolidations in the EMU countries, increasing the tax burden and cutting social benefits would be the best strategy to stimulate the economic activity and to improve budget balance. However, it might not be the case. Indeed, it is important to take in consideration all the fiscal adjustment made during the GFC, where several countries have already increased their tax burden and reduced transfers. Otherwise, the result might not only generate serious welfare damages, but also lead to different results than those expected.

Thus, specific country analysis, outside the scope of this paper, could be useful to provide additional insights to this debate, since it is not clear that the experiences of the past in a few countries are robust enough to similar policy prescriptions in the future.

3.8. References

Afonso, A. (2001). "Non-Keynesian Effects of Fiscal Policy in the EU-15". ISEG/UTL – Technical University of Lisbon, Department of Economics, Working Paper No. 07/2001/DE/CISEP.

Afonso, A. (2010). "Expansionary Fiscal Consolidations in Europe: New Evidence". *Applied Economics Letters* 17 (2), 105-109.

Afonso, A. and Jalles, J. (2014). "Assessing Fiscal Episodes". *Economic Modelling* 37, 255-270.

Afonso, A. and Leal, F. S. (2019). "Fiscal Multipliers in the Eurozone: an SVAR Analysis". *Applied Economics*, 51 (51), 5577-5593.

Afonso, A. and Martins, L. (2016). "Monetary Developments and Expansionary Fiscal Consolidations: Evidence from the EMU*". International Journal of Finance & Economics,* 21, 247-265.

Alesina, A. and Ardagna, S. (1998). "Tales of Fiscal Contractions". *Economic Policy*, 27, 487-545;

Alesina, A. and Ardagna, S. (2010). "Large Changes in Fiscal Policy: Taxes versus Spending". Chapter in NBER book *Tax Policy and the Economy*, 24, 35-68.

Alesina, A., Barbiero, O., Favero, C., Giavazzi, F. and Paradisi, M. (2017). "The Effects of Fiscal Consolidations: Theory and Evidence". NBER Working Paper No. 23385.

Alesina, A., Favero, C. and Giavazzi, F. (2018). "What do we know about the effects of Austerity?" NBER Working Papers No. 24246.

Alesina, A. and Perotti R. (1995). “Fiscal Expansions and Adjustments in OECD Countries”. *Economic Policy*, 21, 205-248.

Alesina, A. and Perotti R. (1997). “Fiscal Expansions in OECD Countries: Composition and Macroeconomic Effects”. IMF Staff Papers, 44 (2), 210-248. Washington: IMF.

Alesina, A., Perotti R. and Tavares, J. (1998). “The Political Economy of Fiscal Adjustments”. *Brookings Papers on Economic Activity*, 1, 197-266.

Arestis, P., Kaya, A. and Sen, H. (2018). “Does fiscal consolidation promote economic growth and employment? Evidence from the PIIGGS countries”. *European Journal of Economics and Economic Policies: Intervention,* 15(3), 289-312.

Auerbach, A. and Gorodnichenko, Y. (2012). “Fiscal Multipliers in Recession and Expansion”, NBER Chapters, in: Fiscal Policy After the Financial Crisis, 63-98, NBER, Inc.

Barbosa, L. and Costa, S. (2010). "Determinantes dos spreads soberanos na área do euro no contexto da crise económica e financeira.". Boletim Económico | Banco de Portugal (Autumn): 143-164. Lisbon: Banco de Portugal.

Barrel, R., Holland, D. and Hurst, I. (2012). “Fiscal Consolidation: Part 2. Fiscal Multipliers and Fiscal Consolidations”. OECD Economics Department Working Papers No. 933. Paris: OECD.

Barro, R. (1974). “Are Government Bonds Net Wealth?” *Journal of Political Economy*, 82 (6), 1095-1117.

Bernheim, B. (1989). “A Neoclassical Perspective on Budget Deficits”. *Journal of Economic Perspectives*, 3 (2), 55-72.

Bertola, G. and Drazen, A. (1993). "Trigger Points and Budget Cuts: Explaining the Effects of Fiscal Austerity". *American Economic Review*, 83 (1), 11-26.

Blanchard, O. (1990). "Comment, on Giavazzi and Pagano (1990)", in Blanchard, O. and Fischer, S. (eds), NBER Macroeconomics Annual 1990, 111-116.

Born, B., Jüssen, F. and Müller, G. J. (2013). "Exchange Rate Regimes and Fiscal Multipliers." *Journal of Economic Dynamics and Control*, 37(2), 446-465.

Brinca, P., Holter, A., Krussel, P. and Malafry, L. (2016). "Fiscal multipliers in the 21st century". *Journal of Monetary Economics*, 77, 53-69.

Carvalho, V. (2009). "Non-Keynesian Effects of a Fiscal Policy in a New-Keynesian General Equilíbrium Model for the Euro Area". Doctoral Thesis, Faculdade de Economia da Universidade do Porto.

Cournède, B. and Gonand, F. (2006). "Restoring Fiscal Sustainability in the Euro Area: Raise Taxes or Curb Spending?" OECD Economics Department Working Paper, 520. Paris: OECD.

Cuestas, J. and Ordóñez, J. (2018). "Fiscal consolidation in Europe: has it worked?". *Applied Economics Letters*, 25(16), 1179-11182.

Devries, P., Guajardo, J., Leigh, D. and Pescatori, A. (2011). "A New Action-Based Dataset of Fiscal Consolidation". IMF Working Paper 11/128. Washington: IMF.

Feldstein, M. (1982). "Government Deficits and Aggregate Demand", *Journal of Monetary Economics*, 9(1), 1-20.

Giavazzi, F. and Pagano, M. (1990). "Can Severe Fiscal Contractions Be Expansionary? Tales of Two Small European Countries", NBER Working Paper No. 3372.

Giavazzi, F. and Pagano, M. (1996). “Non-Keynesian Effects of Fiscal Policy Changes: International Evidence and the Swedish Experience”, *Swedish Economic Policy Review*, 3(1), 67-103.

Guajardo, J. Leigh, D. and Pescatori, A. (2014). “Expansionary Austerity: International Evidence”, *Journal of the European Economic Association* 12 (4), 949-968.

Gupta, S., Jalles, J. T., Mulas-Granados, C. and Schena, M. (2018). “Planned Fiscal Adjustments: Do Governments Fulfil Their Commitments?”, *European Union Politics* 19(3), 383-407.

Ilzetski, E., Mendoza, E. and Végh, C. (2013). “How Big (Small?) are Fiscal Multipliers?” *Journal of Monetary Economics* 60 (2), 239–254.

IMF (1993). "Structural Budget Indicators for the Major Industrial Countries", *World Economic Outlook*, 99-103. Washington: IMF.

Larch, M. and Turrini, A. (2010). “The Cyclically Adjusted Budget Balance in EU Fiscal Policymaking”, *Intereconomics*, 45(1), 48-66.

McDermott, C. and Wescott, R. (1996). “An Empirical Analysis of Fiscal Adjustments”, *IMF Staff Papers*, 43(4), 725-753.

Miller, S. and Russek, F. (1999). “The Relationship between large fiscal adjustments and short-term output growth under alternative fiscal policy regimes”, University of Connecticut Working Paper.

Muñoz, E. and Olaberria, E. (2019). “Are Budget Rigidities a Source of Fiscal Distress and a Constraint for Fiscal Consolidation?” World Bank Policy Research Working Paper No. 8957. Washington: World Bank.

OECD (1996). "The experience with fiscal consolidation in OECD countries", Economic Outlook 59, 3341. Paris: OECD.

Stockhammer, E., Qazizada, W. and Gechert, S. (2019). “Demand Effects of Fiscal Policy since 2008”. *Review of Keynesian Economics*, 7(1), 57-74.

Sutherland, A. (1997). “Fiscal Crises and Aggregate Demand: Can High Public Debt Reverse the Effects of Fiscal Policy?” *Journal of Public Economics*, 65(2), 147-162.

van Aarle, B. and Garretsen, H. (2003). “Keynesian, Non-Keynesian or No Effects of Fiscal Policy Changes? The EMU case”. *Journal of Macroeconomics*, 25 (2), 213-240.

Weyerstrass, K.; Jaenicke, J.; Neck, R.; Haber, G.; van Aarle, B.; Schoors, K.; Gobbin, N. and Claeys, P. (2006). “Economic Spillover and Policy Coordination in the Euro Area”, European Commission, Economic Papers No 246. Brussels: European Commission.

Yang, W., Fidrmuc, J. and Ghosh, S. (2015). “Macroeconomic Effects of Fiscal Adjustment: A Tale of Two Approaches”, *Journal of International Money and Finance* 57, 31-60.

3.9. Appendices

3.9.1. Summary Statistics

Table B. 1 – Summary statistics, full panel, 1960-2017

STATISTICS	Mean	Median	Maximum	Minimum	Std. Dev.	Kurtosis	Observ.
Priv_C	57.84	57.39	81.43	30.43	7.89	4.21	915
Tax	34.71	34.67	48.00	12.24	7.28	2.90	760
ORev	4.49	4.51	44.46	0.55	2.14	3.26	760
CE	10.54	10.55	16.68	5.12	2.00	2.74	760
GFKF	3.43	3.48	6.32	1.24	1.00	2.52	765
Social	14.11	14.06	26.40	2.49	4.43	2.94	760
OExp	13.88	13.77	36.00	3.02	4.58	3.13	760
Population	16238.9	5368.5	82659.0	306.3	22960.8	4.26	1102
Real GDP (=2010)	388.8	147.1	2918.8	3.5	589.2	7.09	855

Source: AMECO

Note: Both fiscal instruments and private consumption are presented as percentage of GDP, population is presented in thousands of people, and real GDP in billion euros (2010 prices).

3.9.2. Summary of Results

Table B. 2 - Results summary: short-run elasticities

Fiscal instrument	Full sample (CAPB)		Sub-sample (CAPB)		Sub-sample (Narrative)		EMU (CAPB)		Non-EMU (CAPB)		Full sample (CAPB with Expans.)		
	Normal times	Consol.	Normal times	Consol.	Normal times	Consol.	Normal times	Consol.	Normal times	Consol.	Normal times	Expans.	Consol.
Δ Tax	0.107		0.146		0.103	0.123	0.263	0.183	0.061		0.124	0.137	
Δ Orev		-0.042		-0.040	-0.009	-0.018		-0.071	-0.010				-0.042
Δ CE	0.050					0.164			0.073		0.082		
Δ GFKF	0.018		0.032	0.045	0.029		0.026	0.047		-0.046		0.031	
Δ Social		-0.150		-0.232			0.093	-0.146		-0.195			-0.152
Δ OExp	0.020				-0.030	0.023			0.034	-0.069	0.028		

Only statistically significant short-run elasticities.

3.9.3. Case Study: Portugal

In Table A3 and in Figure B.1., as an illustration, we summarise the several fiscal episodes that occurred in the case of Portugal. The following analysis focuses more on the 1980s, namely during the period of external intervention, which is referred to in the literature as being an example of a non-Keynesian period.

Table B. 3 – Fiscal episodes and non-Keynesian effects in Portugal (1965-2017)

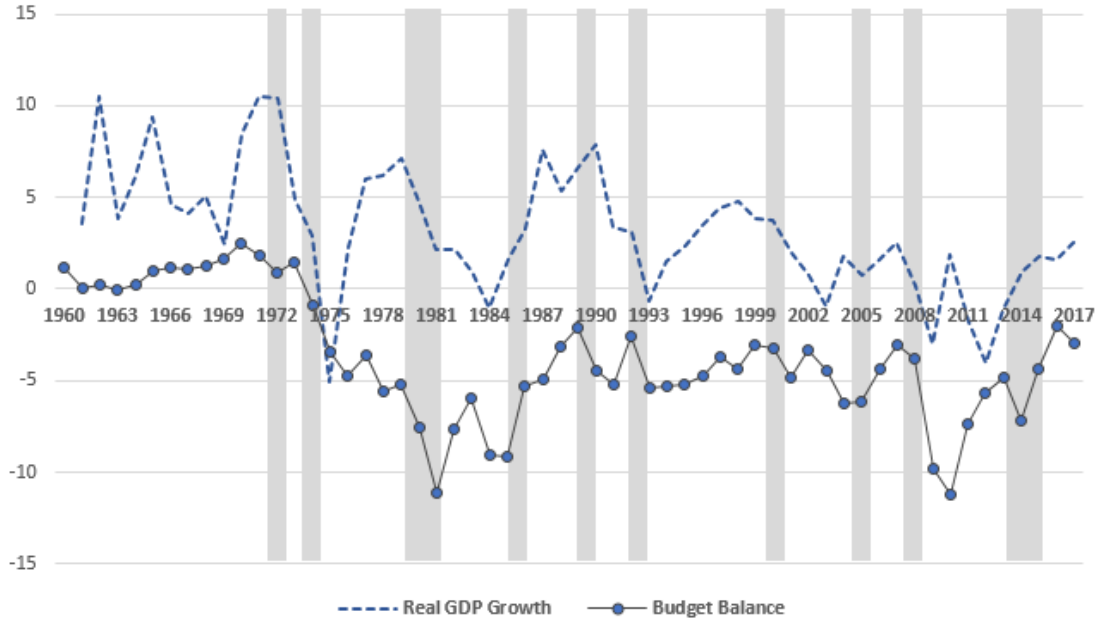
1965-1982	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Fiscal Episodes							E	E		E				E		E	E	C
CAPB	2.0	2.2	2.2	2.2	2.9	3.3	1.8	0.0	0.6	-1.3	-1.3	-1.6	-0.6	-2.5	-2.8	-5.6	-7.2	-3.0
ΔCAPB	*:*	*0.2*	*0.0*	*0.0*	*0.7*	*0.3*	*-1.5*	*-1.7*	*0.6*	*-1.9*	*0.0*	*-0.3*	*1.0*	*-1.9*	*-0.4*	*-2.7*	*-1.6*	*4.2*
Real GDP Growth	9.4	4.6	4.2	5.1	2.4	8.5	10.5	10.4	4.9	2.9	-5.1	2.3	6.0	6.2	7.1	4.8	2.2	2.2
NK Episodes								RE		RE						RE	RE	
1983-2000	**1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
Fiscal Episodes	C			C				E		C	E					E		
CAPB	-0.3	-1.6	-0.6	3.2	2.5	3.4	3.2	1.4	0.5	2.7	0.1	0.5	0.7	0.2	-0.2	-2.0	-1.0	-1.3
ΔCAPB	*2.8*	*-1.3*	*1.0*	*3.9*	*-0.7*	*0.9*	*-0.2*	*-1.7*	*-1.0*	*2.2*	*-2.6*	*0.4*	*0.2*	*-0.5*	*-0.4*	*-1.8*	*1.0*	*-0.3*
Real GDP Growth	1.0	-1.0	1.6	3.3	7.6	5.3	6.6	7.9	3.4	3.1	-0.7	1.5	2.3	3.5	4.4	4.8	3.9	3.8
NK Episodes				EC				RE			RE							
2001-2017	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Fiscal Episodes	E	C		E		C			E	E	C	C		E	C	C	E	
CAPB	-2.9	-0.9	-1.0	-3.2	-3.1	-1.4	-0.7	-1.1	-5.9	-8.3	-2.5	1.2	2.1	-0.7	1.0	2.7	0.8	
ΔCAPB	*-1.5*	*1.9*	*-0.1*	*-2.2*	*0.1*	*1.7*	*0.6*	*-0.4*	*-4.7*	*-2.4*	*5.8*	*3.6*	*0.9*	*-2.8*	*1.7*	*1.7*	*-1.9*	
Real GDP Growth	1.9	0.8	-0.9	1.8	0.8	1.6	2.5	0.2	-3.0	1.9	-1.8	-4.0	-1.1	0.9	1.8	1.9	2.8	
NK Episodes	RE					EC			RE						EC	EC		

Source: Authors' calculations.

Note: E – Fiscal Expansions; C – Consolidations; RE – Recessive Expansions; EC – Expansionary Consolidations

NKE are episodes where: i) the average real GDP growth during the two years after the fiscal contraction is greater than the growth during the two years before, and; ii) the real GDP growth during the two years after the expansions is smaller than the average growth during the two years before.

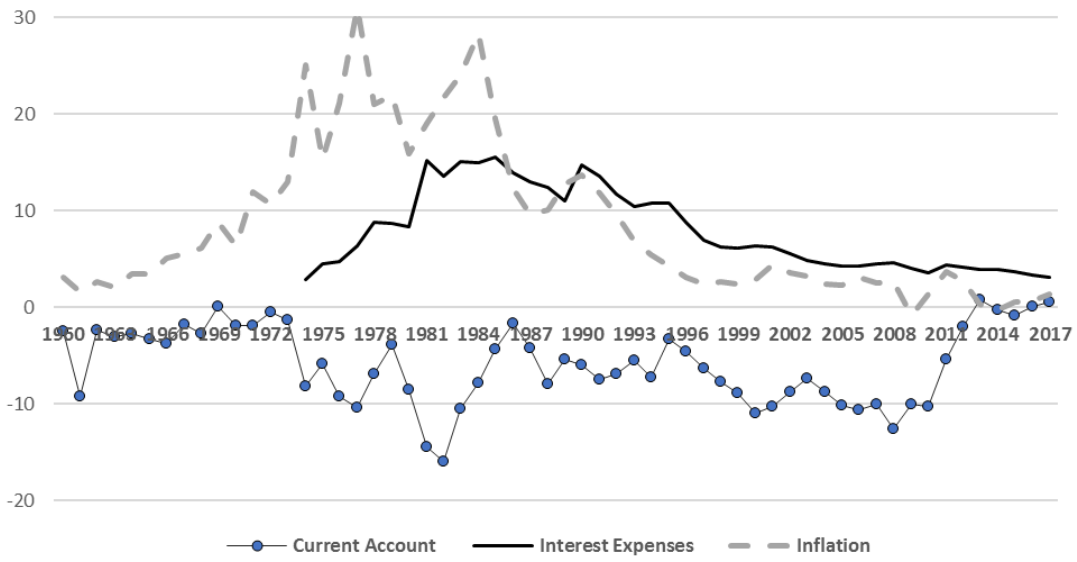
Figure B 1 - Real GDP growth and budget balance (left axis, % GDP) and unemployment rate (right axis) (1960-2017)



Source: AMECO.

During the early 1980's, Portugal faced persistent high budget deficits (attaining values above 11 p.p. of GDP), which were not fully offset by the impact on economic growth, which revealed weak growth rates in real terms (which were boosted by the application of monetary measures). This seems to have led to an increase of the debt ratio from year to year, accompanied by both a rise in inflation and difficulties in sovereign financing (see Figure B.2.).

Figure B 2 - Current account, interest expenses (% GDP), and inflation rate (CPI) (1960-2017)



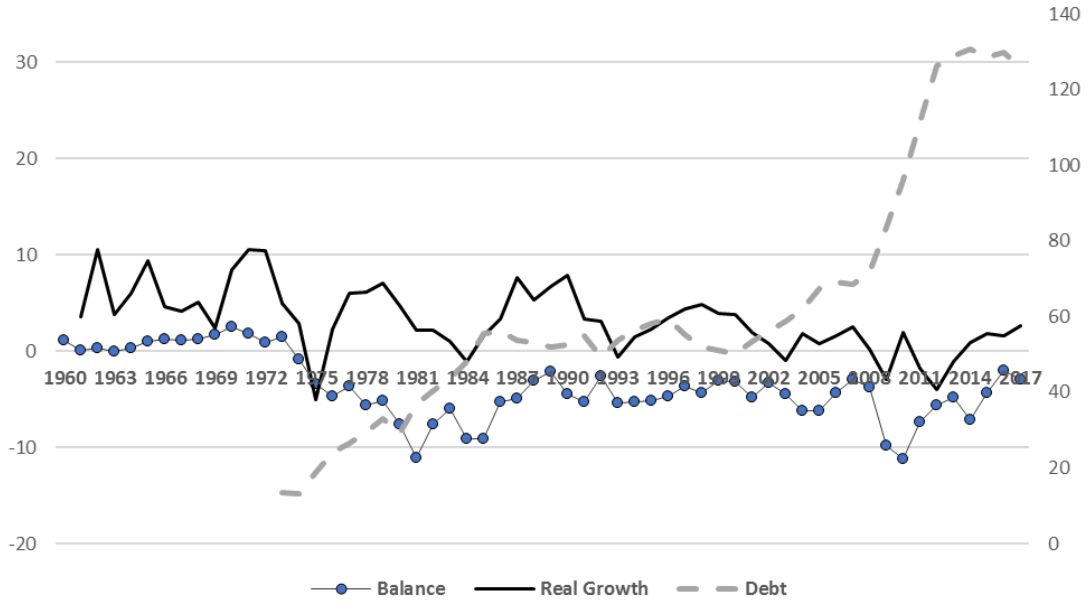
Source: AMECO and OECD.

In this framework, and following the 1979 oil shock, Portugal was forced to apply a more restrictive fiscal policy and had to request external intervention, signing the second Stability Programme with the IMF, in order to control the public accounts, reduce inflation, and correct the current account imbalances. Later, in 1986, after the introduction of VAT (Value Added Tax) and a tax on petroleum products, a strong increase in tax revenue was observed.

The resulting of the joint impact of this fiscal consolidation and Portugal's accession to the EEC (European Economic Community), strong economic growth was experienced in January 1986, which was simultaneous with a budget deficit decrease (from 9.2% of GDP in 1985, to 2.1% in 1989) and also a reduction in the debt-to-GDP ratio of 3.8 p.p. Alesina and Perotti (1995) called this a "stop and go" episode (Figure B.3.).

Thus, with favourable stock-flow adjustments arising from the privatisation programme, the correction of external imbalances, reductions in the sovereign interest rate, an increase in competitiveness, and also a currency devaluation, Portugal appeared to have achieved an economic recovery. However, in spite of the reduction in public expenditure, the compensation of employees in the public sector presented an increasing trend (Afonso, 2001). As a result, since the fiscal consolidation, Portugal experienced a reduction in unemployment (Figure B.4.), an increase in private demand (both in private consumption and in investment), and an increase in the potential output growth rate.

Figure B 3 - Balance, real GDP growth (left axis), and gross public debt (right axis) (% GDP, 1960-2017)



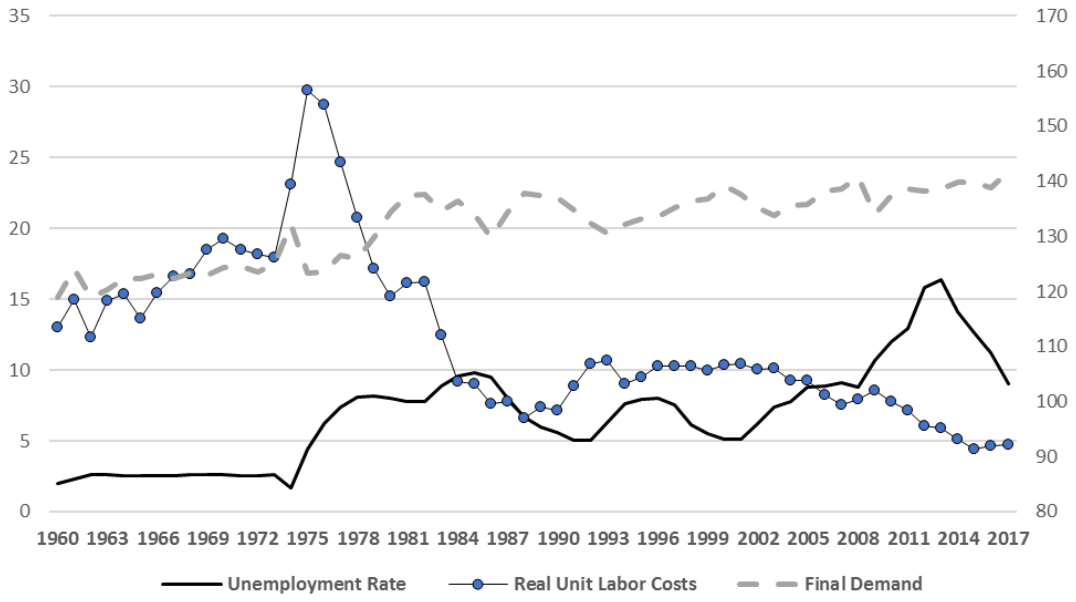
Source: AMECO.

The 1986 expansionary consolidation is often referred to in the literature as being an example of a non-Keynesian episode.

Lastly, the recent years of 2015-2016 could, in effect, be new examples of expansionist consolidations, where, benefiting from expansionary monetary policies and a positive

international conjuncture, Portugal recorded robust economic growth and a strong decrease in the unemployment rate.

Figure B 4 - Unemployment rate (left axis) real ULC[14] and Final Demand (% GDP) (right axis) (1960-2017)



Source: AMECO.

[14] Ratio of compensation per employee to nominal GDP per person employed.

4. Political Budget Cycles in the Eurozone*

4.1. Introduction

Following the creation of the Economic and Monetary Union (EMU), the Maastricht Treaty was signed to provide fiscal robustness and stability, requesting a stringent supranational commitment. Thus, after 1992, there was a gradual loss of fiscal autonomy of the EU member states, due to the debt-to-GDP and deficit-to-GDP criteria of 60% and 3%, that had to be met by the potential member states before their accession to the EMU and be sustained afterwards (Andrikopoulos et al., 2004).

However, despite the constraints imposed by the European Authorities, the expansionist pro-cyclical policies remained sometimes observed (see Figure 4.1), eroding fiscal buffers.

Among other reasons, the literature argues that this European deficit bias may arise from opportunistically motivated electoral purposes, i.e. political budget cycles. As defined by Vergne (2009), the political budget cycles theory describes how fiscal policy affects the re-election probabilities of incumbent Governments.

* We thank the co-editor of the Portuguese Economic Journal, for useful comments.

Given the high amounts of public debt accumulated in the majority of the western European countries during the last decades, the recent European sovereign debt crisis had serious influence on policy making, on risk premium and on people's welfare. Since then, fiscal discipline and the sustainability of public debt has become prominent issues nowadays, constraining electoral strategies.

In this context, the present chapter, using a IV-GMM model, aims to assess the existence of political budget cycles in the EMU, and to explain how elections might affect the budget composition, as well as the impact of the Great Recession on the incumbent Governments strategy.

The chapter is organized as follows. Section 4.2 is the literature review. Section 4.3 presents the data analysis and some statistical considerations, and Section 4.4 describes the methodology and the empirical assessment. Section 4.5 presents robustness estimations and Section 4.6 concludes.

4.2. Literature Review

4.2.1. Fiscal Policy Biases

Government debt accumulation has increased significantly since the 1970s in the majority of the European countries, resulting from a deficit bias in fiscal policy-making, which created severe consequences to the most indebted economies during the last Great Recession. That indebtedness path and the policy debate regarding its inherent risks created the need to impose rules to provide fiscal discipline and to enable the creation of the single currency (Krogstrup and Wyplosz, 2009).

The Stability and Growth Pact and its underlying measures, was then designed to constrain fiscal discretion in order to prevent national fiscal policies from having negative spillovers on other countries, to create fiscal buffers (to enable the proper functioning of the automatic stabilizers - taxes and transfers) and to apply counter-cyclical policies.

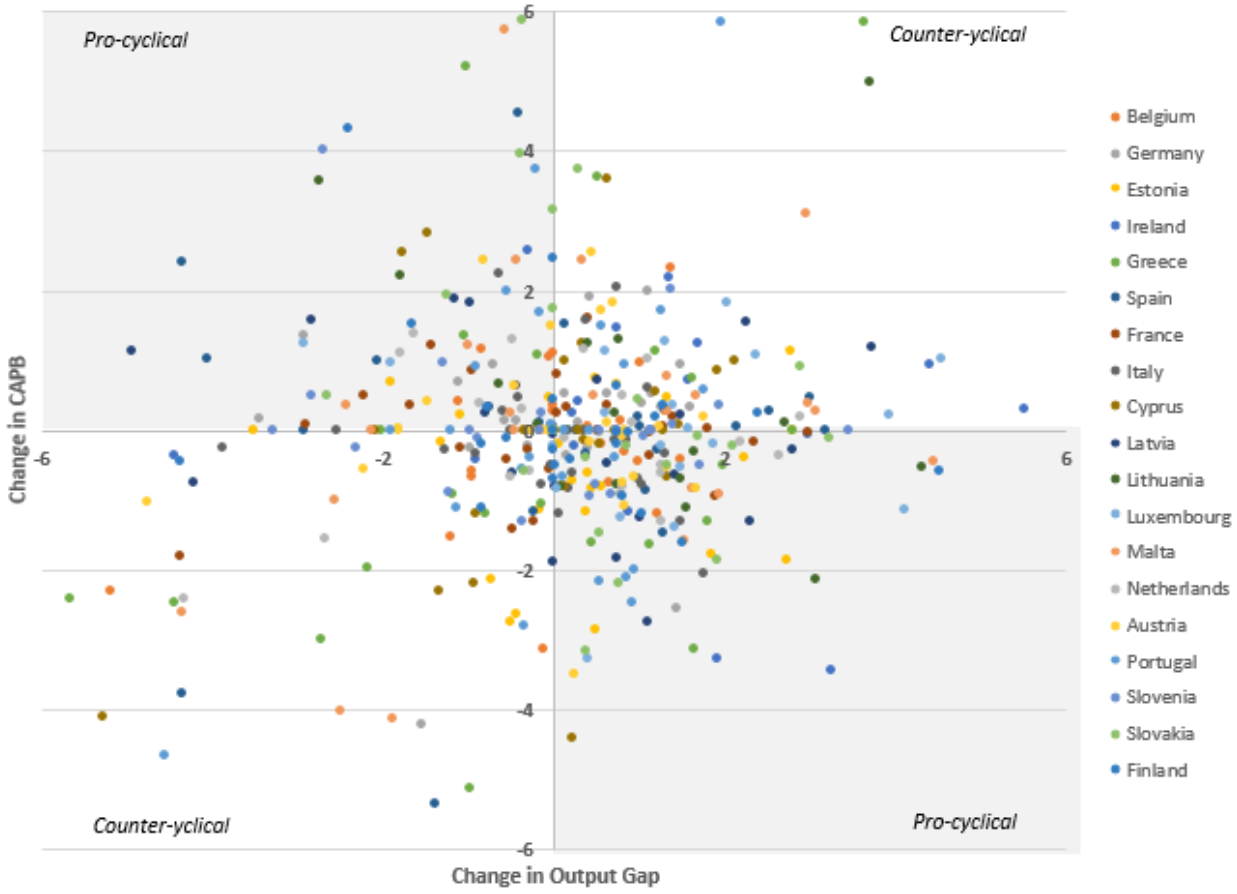
Thus, since 1992, member states have gradually lost some of their fiscal autonomy, due to the debt and deficit criteria that were expected to constraint national policies, regardless of ideological differences (Andrikopoulos et al., 2004).

However, those criteria were broadly criticized for the weak mechanisms to prevent politically motivated fiscal policies (Buti and Van den Noord, 2003). Despite the constraints imposed by the European Authorities, the pro-cyclical policies, i.e., fiscal expansions on positive output gaps or contractions on negative output gaps, remain often observed.

Then, facing recurrent expansionary bias and eroding fiscal buffers, pro-cyclical austerity measures might become unavoidable.

Figure 4.1 presents the fiscal policy biases in the Eurozone countries. The fiscal expansions or contractions are measured by the change in the cyclically adjusted primary balances (CAPB), and economic upswings and downswings are identified through the output gap.

Figure 4. 1 – Pro-cyclical and counter-cyclical fiscal policies in the EA19 (1995-2017)

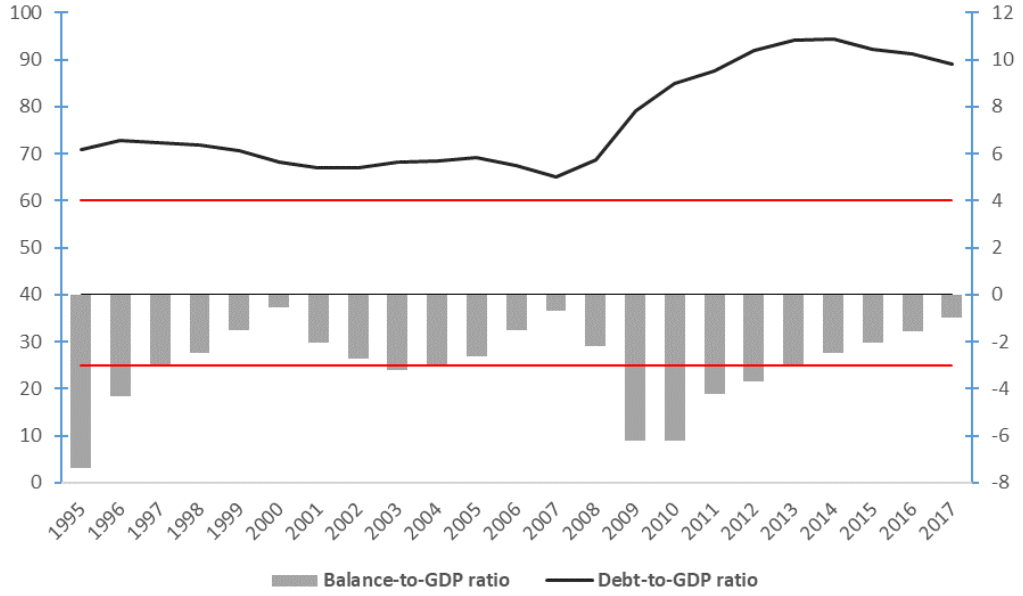


Sources: AMECO; authors' estimates.
Note: The sample includes 19 EA countries over 1995–2017. Outlier observations (above 6 percent and below −6 percent) are excluded to improve the visual representation of the scatterplot.

As a result, the Eurozone countries showed high differences comparing to the Maastricht reference values for the stock of public debt and for the budget deficit as a share of GDP (60% and 3%, respectively).

According to Figure 4.2, one can observe that, on average, the EA19 countries never achieved a debt-to-GDP ratio below the 60% and didn't meet the balance-to-GDP criteria in the years of 1995-1996, 2003, and 2009-2012.

Figure 4. 2 – Comparison against the budget-to-GDP (right axis) and debt-to-GDP criteria (EA19 average: 1995-2017)



Sources: AMECO.

The deficit biases, the debt accumulation and the criteria's non-compliance might result, among other reasons, from political incentives during electoral years.

4.2.2. The Role of Political Motivations

Democracy is an essential feature to provide political structures and has the power to induce better policies. The existence of free and regular competitive elections, incentives governments to be more efficient, weeding out incompetent politicians. However, despite the scrutiny and commitment given to the population, political parties, intending to renew their legitimacy, may have other goals during electoral periods (Vergne, 2009).

In the past few decades, the economic literature has been studying the politically motivated policies, to better understand how politicians might manipulate their policies to increase the chances of re-election (Vergne, 2009; Buti and Van den Noord, 2003).

The contributions pass through studies of electoral budget cycles (Rogoff and Sibert, 1988), analysis of the influence of political systems on the fiscal execution (Persson and Tabellini, 2002) and models of opportunistic or partisan behavior (Sapir and Sekkat, 2002).

The political business cycle theory, based on market imperfections and information asymmetries, explains the consequences of elections. As argued in Eyraud et al. (2017), political economy factors create policy distortions that can result in suboptimal fiscal outcomes, namely trough pro-cyclical spending increases, using the fiscal space needed to stabilize the business cycles during downturns. Moreover, electoral incentives could lead to the maintenance of unproductive spending and increasing distortionary taxes, jeopardizing the economic growth.

In Andrikopoulos et al. (2004) the political business cycles are split in electoral and partisan purposes. The authors argued that while electoral (opportunistic) cycles are characterized by key target and policy variables to re-elect the incumbent government, regardless the ideological orientation, the partisan cycles are conditioned by differences upon the ideology of the party in power and its competitors. Moreover, proportional political systems (where parties form coalition governments) are less prone to partisan cycles. Indeed, coalition governments tend to generate moderate policies but also to create larger budget deficits and build up government debt (Alesina et al., 1997).

According to the literature, the politicians' re-election and the partisan's goals create incentives to use pre-election spending, investment promises and excessive revenue forecasts to support the electoral confidence. Due to the people's imperfect understanding of financial issues, not perceiving the government intertemporal budget constraints, they would be excited by an available (disposable) income increase or better public services (Alesina and Perotti, 1995; Debrun et al., 2009).

However, policy makers often deviate from their targets after elections, harming economic agents, who might have already adjusted their consumption and expectations. The literature also argues that electoral purposes, facing some lobby pressures, might lead to a "common pool" problem, i.e., an excessive spending to a particular group, while the costs would be spread over all the population (Eyraud et al., 2017).

Indeed, some authors concluded that governments that damage the financial position reduce their chances of re-election, arguing that voters tend to be fiscally conservative, punishing rather than rewarding high budget deficits (Drazen and Eslava, 2005).

4.2.3. Effects on the Composition of Fiscal Policy

According to Buti and Van den Noord (2003) and Milesi-Ferretti et al. (2002), the literature predicts that facing an electoral period, policy makers tend to undertake short-sighted policies and apply tax cuts (supposedly without clear implications for government spending). Thus, discretionary policies are expected to expand in pre-election and in election years, and economic growth to be stronger, resulting from optimistic prospects. In fact, in non-electoral years, government appears to tight fiscal policy to create safety margins to support fiscal expansions in electoral years.

The political business cycles designed in Rogoff (1990), based on information asymmetries, argues that votes depend on the consumption of private and public goods, and gives insights on how the current expenditure might be manipulated during electoral periods (public investment would only be visible in the following years). According to the model, the incumbent strategy will also depend on the information asymmetry about

its own competence, considering that citizens are uninformed about the development of incumbent's skills and its advisors.

Since voters only observe current expenditure and taxes contemporaneously, in Vergne (2009) it's argued that electoral factors have significant impacts on the allocation of public expenditure, shifting towards more visible current expenditure, such as wages and subsidies, instead of capital expenditure. Furthermore, in developing countries, whilst tax cuts have no significant impact on the voter's opinion (since the tax base is smaller in those countries), the expenditure measures have a special role, having a very direct and immediate impact on people's welfare.

The organized interest groups also play a role on the political business cycles, namely, to finance the electoral campaigns and to mobilize the citizens (Grossman and Helpman, 1996). According to the public expenditure targeting models, in order to conquer the lobbies' support, the incumbent government has the incentive to target investment expenditure to specific groups (instead of being focused on proving its competence) (Drazen and Eslava, 2005). According to Vergne (2009), the distribution of preferences might exacerbate the political business cycle, since the larger fraction of swing voters (voters that may vote in two or more parties), the larger will be the incentive to increase the targeted spending before the election, namely, to favor groups with greater electoral relevance. Besides, it is typically observed spending increases in infrastructure projects (opportunistic targeted), since these are easier to target due to their geographical and sectorial specificity.

4.2.4. Empirical Results

In Vergne (2009), both the predictions of the Rogoff's "visibility expenditure" model and the public expenditure targeting model were tested, i.e., if the hypothetical expenditure increase will be associated with current, rather than capital expenditure, or if capital expenditure will be used as a target to specific groups and locations. The results showed that policy makers will prefer to use broad-based rather than targeted capital spending in electoral years. Moreover, politicians prefer to change the expenditure allocation instead of increasing the budget deficit, since voters seem to punish instead of reward high deficits.

Observing 85 different economies in 1975-1999, Shi and Svensson (2006) concluded that the electoral impact on Government balance is larger in developing countries and small or non-existing in industrial countries, and the institutional indicators can explain large part of these differences.

Drazen and Eslava (2008) analysing 74 countries in the period 1960-2003, tested if voters are fiscally conservative or if they punish deficit bias. Indeed, they did not find evidence of electoral benefits from fiscal expansions, both in developed and developing countries, and in different electoral systems.

In Europe, as argued by Efthyvoulou (2012), the EMU Member States appear to have a statistically more robust political budget cycle than the remaining countries. Moreover, the degree of fiscal manipulation is negatively correlated with non-economic motived voting and positively correlated with the electoral competitiveness. In addition, Andrikopoulos et al. (2004) tried to understand if EU countries have used fiscal policy instruments to stabilize the business cycle or to satisfy electoral and partisan purposes.

The results show that governments were focused on pursuit of stabilization policies, to avoid inflation and unemployment increases in the 70's and 80's.

Studying the Greek economy in the period 1974-2011, Chortareas et al. (2018) realized that despite political budget cycles have subdued after the Maastricht treaty, public finances were manipulated in electoral years through compensation to employees. The authors also concluded that prolonged incumbencies have a negative influence on primary balance, regardless the partisan's orientation/ideology.

Table 4.1 provides a brief summary of empirical contributions regarding political budget cycles. Accordingly, when compared to previous studies, this chapter provides an updated and more detailed analysis of the impact on each fiscal instrument and provides insights into how the results may change following the recent economic and financial crisis.

[Table 4.1]

4.3. Analysis of Fiscal Statistics

4.3.1. Elections

The first step of this research is to analyse the fiscal statistics on the EA19, splitting the sample in electoral and non-electoral years. The assessed variables are the General Government balance, the CAPB (cyclically adjusted primary balance), debt-to-GDP ratio, real GDP growth, direct and indirect tax burden, compensation of employees, GFKF (gross fixed capital formation) and other current expenditure, which includes all the current expenditure excluding the compensation to employees. Data came from the

AMECO database based on ESA 2010 to provide a more reliable and comparable information across countries and time. Appendix 4.8.3. presents the statistical summary.

[Table 4.2]

According to Table 4.2, Eurozone countries have, on average, worst budget balances in electoral years, with 0.32 p.p. higher deficits than in the remaining years. Excluding the cyclical effect and the interest expenses, the European countries revealed expansionist policies during electoral periods, presenting a CAPB of -0.13% of potential GDP.

As expected, given the existing literature, the non-electoral years are used to recover savings (average CAPB of 0.30%). The debt-to-GDP ratio presents an increasing path in both electoral and non-electoral years, but with a higher variation in the first case (+0.31 p.p.).

Regarding the fiscal instruments, direct tax burden appears to have increased in the EA19 since 1995 but softening facing elections. The share of indirect taxes on GDP decreased about 0.05 p.p. in electoral years (increasing at the same rate in the remaining years).

On the expenditure side, compensation to employees tends to increase 0.03 p.p. facing elections and to decrease 0.06 otherwise. This path reveals the opposite trends of taxes and the civil servants' wages, that might have led to a wealth deterioration during the last decades. The budget manipulation is even higher on the other current expenditure, with an average increase of 0.06 p.p. (-0.05 p.p. in the remaining years).

However, the investment level seems to contradict the "Public expenditure targeting model", since it decreases 0.05 p.p. facing elections (increases 0.01 p.p. in non-electoral

years). The Rogoff's "visibility expenditure" theory appears to be capable to explain the budget manipulation in Eurozone countries, evident on the compensation to employees and other current expenditure.

The Table 4.3 highlights fiscal variables in the year before elections to assess if the fiscal policy has a different pattern in that period, namely through expectations, income or sustainability perceptions.

[Table 4.3]

The results are illustrative of the influence that the electoral cycle might have on the fiscal policy strategy. When compared to the remaining years, not only the electoral year but also the year before elections appears to have some differences in both balance and budget composition.

Firstly, the statistics show that the year before elections use to be the most expansionist one, with an 0.16 p.p. average decrease on CAPB. However, the expansionist policies weren't applied through a tax decrease or wages increases, but an 0.08 p.p. increase on investment and 0.07 p.p. on other current expenditure.

On the other hand, in the remaining years, policy makers are used to creating fiscal buffers, with consolidation policies (annual increases of 0.2 p.p. in the CAPB), based on tax increases and cuts on public expenditure.

4.3.2. The Influence of the Crisis

Table 4.4 presents the fiscal statistics for the period before and after the beginning of the Great Recession (2007), to understand how the financial crisis and the sovereign debt crisis (with consequent deterioration of fiscal conditions, the increase on financing costs and the restrictions imposed by the international institutions) might have changed the political budget cycles.

[Table 4.4]

According to the data, both tax burden and investment had increasing paths during the decade 1996-2006, and the compensation to employees and other current expenditure observed annual decreases (on average). However, all the fiscal variables changed their behaviour for electoral purposes, i.e., the policy maker applied tax reliefs and increased the current spending, abdicating investment.

On the other hand, the decade 2007-2017 was characterized by a disinvestment strategy to support strong increases on other current expenditure (maybe due to the high level of social benefits paid during the crisis). Moreover, despite the tax rate increases observed in several European countries during the last crisis, the tax burden didn't grow very much, since the tax base fell during the period. The electoral strategy followed by the incumbent Governments was to decrease both GFKF and other current spending, and increase the direct tax burden, in order to finance indirect tax reliefs and rise compensation to employees.

4.3.3. The Influence of the Indebtedness Level

To understand the role of the indebtedness level in the budget manipulation, Table 4.5 presents fiscal statistics separated by thresholds of the debt-to-GDP ratio. The debt levels were organized as follows: lower indebted countries have debt ratios lower than 60% (complying the Maastricht treaty limits); the highly indebted countries are those that do not-comply with the treaty limit but do not have an excessive situation; the excessively indebted countries are those whose debt ratio exceeds 100% of GDP.

[Table 4.5]

According to Table 4.5, less indebted countries tend to reduce the tax burden. As expected, the election years are characterized by faster reductions, especially on indirect taxes. On the opposite direction, highly indebted countries use to increase the tax burden, but in a lower rhythm facing elections. The excessively indebted countries also have an increasing tax burden path, with the exception of the direct taxes in electoral years (average change of -0.02 p.p.).

On the expenditure side, the lowest indebted countries reveal a current spending reduction path. The investment level has a different behaviour, increasing about 0.05 p.p. year-on-year, but falling 0.11 p.p. in elections. The highly indebted countries, despite the negative expenditure path, manipulate current spending facing elections. The GFKF is expected to remain unchanged, but it decreases on average 0.08 p.p. facing elections.

Lastly, the excessively indebted countries show an increasing path on other current expenditure. Also, the compensation to employees only rises facing elections and the

investment reveals a different behaviour when compared to the other groups of countries. Despite the fast investment reduction (year-on-year change of -0.24 p.p.), the pace slows down in electoral years, to -0.07 p.p.

4.3.4. The Influence of the EMU Membership

Regarding the influence of the participation in the EMU, the sample was divided between countries inside and outside the Euro Area. Table 4.6 presents fiscal statistics before and after countries joined the monetary union.

[Table 4.6]

According to the results, both in the EMU and in the non-EMU, fiscal policy seems to be less stringent facing elections.

The results show that non-EMU countries exchange indirect for direct taxes, during elections, decreasing the indirect tax burden (-0.09 p.p. of GDP). Government current spending was reduced simultaneously.

After joining the EMU, there has been a complete change on fiscal policy in electoral years. Both direct and indirect taxes fall (-0.04 and -0.03, respectively) and the current expenditure increases.

Once again, there was a reduction in the investment level as percentage of GDP (-0.13 and -0.10 p.p. inside and outside the EMU, respectively).

4.4. Estimation Results

4.4.1. Baseline Estimations

In order to capture the effect of elections on fiscal policy, it was used a typical reduced form specification:[15]

$$y_{it} = \beta y_{it-1} + \delta Elections_{it} + \varphi Elections_{it-1} + \theta X_{it} + \lambda_i + u_{it} \qquad (1)$$

where y_{it} denotes the fiscal (dependent) variables, and y_{it-1} is the lag of the variable to capture the persistence of fiscal variables. The dummy variable $Elections_{it}$ assumes 1 in election years and 0 otherwise, and X_{it} is a vector of economic control variables, namely the variation of the unemployment rate, the real GDP growth, and the real long-term real interest rates. Lastly, λ_i are country-specific effects and u_{it} represents the error term.

In order to perceive how the incumbent Government might start manipulating people's will, expectations and perceptions in the year before elections, the dummy $Elections_{it-1}$ was included in the specification.

The Generalized-Method-of-Moments (GMM) estimator, developed for models of dynamic panel data, was used to avoid inconsistency problems and to control a potential endogeneity of the explanatory variables, using instrumental variables. Following Arellano e Bond (1991), the instruments used are lagged levels of the dependent variable (two periods) and one period for the level equation.

The sample is composed by 19 Eurozone countries (EA19) between 1995 and 2017. The data were obtained from the EC AMECO Database (based on ESA 2010).

[15] See, for example, Chortareas et al. (2018).

For comparison, a Fixed Effects estimation is also presented in Table 4.7.

[Table 4.7]

According to Table 4.7, and contrarily to the Fixed Effects estimation, the GMM output reveals the existence of political budget cycles in the EMU countries, i.e., the presence of elections significantly influences the primary balance.

As explained in Shi and Svensson (2006), the presence of lagged dependent variables and the country-specific effects render the OLS estimator biased. The Fixed Effects estimator can eliminate the country-specific effect, however, the bias caused by the inclusion of lagged dependent variables remains. The bias influences all variables and depends on the length of the time series and only when it goes to infinity will the estimator be consistent. For this reason, the remaining analysis will be mainly focus in the GMM estimation (Arellano-Bond estimator).

As expected, the lagged fiscal variables are all significantly positive.

The GMM output shows that primary balance is negatively influenced by elections, leading the incumbent Government to reduce the revenue, and to increase the primary expenditure (despite not statistically different from zero).

Furthermore, the year before elections seems to be used to generate a fiscal buffer to accommodate expansionary policies in the next year, since it has a positive influence on primary balance. The influence on both revenue and primary expenditure isn't significant to explain fiscal policy, but points to a saving orientation, improving the primary expenditure.

The real GDP growth influences negatively both expenditure and revenue, but the last one in a lower level, since the policy makers are expected to use positive conjunctures to improve their fiscal conditions, reducing public spending but diminishing revenue at the same time.

The unemployment rate reveals the operation of automatic stabilizers. When it increases, the government revenue decreases (due to a tax base reduction) and increases the primary expenditure (substitution effect and more social benefits).

The long-term real interest rates, representing the cost of public financing, significantly induces fiscal consolidations. As expected, it constrains public spending but doesn't seem to increase the government revenue as an alternative financing source.

Alternative estimates were made for more desegregated fiscal variables: direct and indirect taxes, compensation to employees, other current expenditure and investment. Table 4.8 shows the results.

[Table 4.8]

According to the results, the political budget cycles are mainly driven by the manipulation of direct tax burden, compensation to employees and other current expenditure.

During electoral years, the incumbent government seems to decrease the tax burden (indirect taxes reveal a negative influence but not statistically significant), and to increase the current expenditure (both compensation to employees and other current expenditure are positively influenced and significant at 1%).

Contrarily to the public expenditure targeting model (Drazen and Eslava, 2005), the investment level isn't influenced by elections. Indeed, Table 4.8 seems to support the Rogoff's "visibility expenditure" model predictions (Rogoff, 1990).

In addition, the tax burden manipulation strategy seems to start in the year before elections, since the direct taxes are negatively influenced by the dummy variable (-0.15). However, the fiscal buffer is constructed through other current expenditure saving (-0.15), that will be spent in the following year.

The current expenditure also seems to be countercyclical, i.e., tend to decrease facing a stronger economic growth. The reason for the decrease in other current expenditure (-0.27) might have to do with the volume of social benefits paid (positive relation with unemployment, despite not statistically significant), and the compensation to employees (-0.09) doesn't growth, at least, at the same rate of GDP.

Moreover, only the direct tax burden is statistically (negatively) influenced by unemployment, and the real long-term interest rate doesn't seem to statistically influence any of the fiscal instruments, despite showing a negative sign in all the expenditure variables.

4.4.2. The Impact of the Great Recession

Moving forward, to better understand how the Great Recession might have changed the policy maker's ability to manipulate fiscal instruments during elections, a new estimation was performed splitting the sample in 2007, i.e., the period before the beginning of the financial crisis (1995-2006) and after (2007-2017).

The GMM estimation is presented in Table 4.9.

[Table 4.9]

According to Table 4.9, the electoral influence on fiscal policy seems to have changed since 2007.

Whilst in the period before 2007 the current expenditure was positively influenced by elections (0.18 on compensation to employees and 0.27 on other current expenditure, both in percentage of GDP), it has only significantly influenced the indirect tax burden since then (-0.17). This change might have to do with the increase on financing costs during the crisis and the expenditure restrictions imposed by Stability and Growth Pact rules, as the Expenditure Benchmark[16].

The year before elections, contrarily to Table 4.8, is only significant to explain the Gross Fixed Capital Formation, but surprisingly with opposite signs. Between 1995 and 2006 the investment level seemed to decrease in the year before elections, probably to safe fiscal buffers and delay investment announcements, increasing the capital expenses during the electoral period (despite not significantly different from zero). However, in 2007-2017 the investment was higher before elections.

The real GDP growth rate influences negatively both compensation to employees and other current expenditure in both sub-samples. In addition, whilst it was used to increase the tax burden and investment before crisis, economic growth appears to be used to reduce

[16] This benchmark is a rule, which contains the net growth rate of government spending at or below a country's medium-term potential GDP growth rate, depending on the country's position in relation to its medium-term budgetary objectives (MTOs).

taxes since 2007, reviling a pro-cyclical fiscal strategy. Moreover, economic growth lost the ability to significantly explain investment variations.

As expected, increases in unemployment rate have a negative impact on tax revenue (statistically significant for direct taxes in 1995-2006 and for indirect taxes in 2007-2017). However, it doesn't influence the current expenditure variables, but the capital one. The result shows a positive relation between unemployment and investment.

Furthermore, before the crisis, the real long-term interest rate had a negative impact on investment, and positive on both direct taxes (alternative financing source) and compensation to employees. Since the crisis, the indirect taxes have become the main alternative financing source and the interest rate influences negatively the compensation to employees.

Recapping the main results of Tables 4.7, 4.8 and 4.9, its perceived the existence of political budget cycles in the EMU, where the incumbent Government manipulates both the tax burden and current expenditure facing electoral periods. Moreover, the crisis seems to have changed the electoral fiscal strategy, since policy makers lost the ability to increase expenditure due to the higher financing costs and the expenditure restrictions imposed by Stability and Growth Pact.

4.5. Robustness

To perform a robustness test, a Fixed Effects specification was performed, using the elections' dummy to distinguish the influence of macroeconomic control variables on fiscal instruments. The goal is to understand how fiscal instruments might react in a different way in the presence of an electoral year.

In addition, it was also included the debt-to-GDP change in t-1 to assess the presence of a Ricardian fiscal regime, i.e., if the fiscal policy may change as response to variations on the debt level in the previous year.

As the fiscal variables might have different trends, the Fixed Effects model assesses the impact of fiscal and control variables throughout time, assuming that time-invariant characteristics are country specific. Considering that the Fixed Effects model removes the effect of time-invariant characteristics from the predictor variables, it might be a suitable approach.

The Hausman test supported this assumption, showing that the error term and the constant are not correlated with the other variables. Moreover, for all the estimations we have a redundant Fixed Effects Likelihood test, where the null hypothesis (no unobserved heterogeneity) was rejected.

Thus, the specification is:

$$\Delta y_{it} = \alpha_i + \beta y_{it-1} + Elections \text{ X } (\delta X_{it}) + (1 - Elections) \text{ X } (\theta X_{it}) + \mu_{it} \qquad (2)$$

In addition to the baseline estimation (1), four additional estimations were made, splitting the sample in countries with a debt ratio under (2) and above (3) 60% of GDP (Table 4.10) and, inside (4) and outside (5) the EMU (Table 4.11).

Table 4.11 shows the Wald Test for the baseline estimation.

[Table 4.10]

[Table 4.11]

Giving the Tables 4.10 and 4.11, one might conclude from output (1) that the real GDP growth has a similar impact on primary balance during electoral and non-electoral years (0.18 – 0.20). In addition, the incumbent Government tends to deteriorate the primary balance facing unemployment increases (-0.67), due to social benefits.

During non-electoral periods, the policy makers usually improve the balance in response to financing costs increases and reveal a non-Ricardian response facing a debt increase in the previous year. Thus, the Wald Test might reveal the relevance of the budgetary performance and debt control for electoral proposes in the EMU, reflecting the increasing voter's concern regarding the high amounts of public debt accumulated during the last decades, and the consequent costs on people's income and welfare.

Regarding the revenue, during electoral periods, it tends to increase in response to debt shocks (0.05), showing the Ricardian behaviour of policy makers. As expected, government revenue also increases facing falls on unemployment rate (0.06), due to the increase of the tax base and the decrease of social benefits. However, the result is different in the absence of elections, where just the real GDP growth seems to be statistically significant (-0.11), since the government might use a positive economic moment to reduce taxes.

On the primary expenditure side, it decreases facing a faster economic growth (-0.52 during elections, -0.40 if not), and increases facing debt shocks (0.06), but only in the absence of elections. Moreover, despite not significantly different from zero, the Wald test showed that unemployment rate decreases have a more negative impact on government spending (substitution effect) in electoral years.

Comparing the results for countries with stocks of public debt under (2) and above (3) 60% of GDP, one can see that the inference of fiscal instruments on primary balance isn't particularly different in terms of sign, but on the statistical significance and magnitude. However, it is perceived that, since voters are concerned with the issue of fiscal sustainability, debt might change the electoral strategy. Indeed, policy makers are more focused on improve primary balance during elections, using better economic conjunctures to apply more restrictive policies.

On the primary balance, and during electoral periods, the only significant difference is on the response to unemployment, having a stronger and statistically reaction in the less indebted countries (-0.73 against -0.59). In the absence of elections, the result inverts and the most indebted counties have a higher response (-0.94 against -0.23) to employment falls. Furthermore, whilst the less indebted countries are used to deteriorating the primary balance facing increases on the indebtedness level (-0.11) and to improve it in response to a stronger economic growth (0.26), the same seems not happen in the counterfactual group.

On the revenue side, the only significant variables during elections are the lagged change on the debt ratio and the unemployment rate in the lowest indebted countries (0.10 and -0.15, respectively) and the interest rate in the most indebted ones (0.13). In the remaining period, both groups have negative responses to economic growth, but continues to exhibit different sign facing changes on the unemployment rate. When it falls, the Government revenue tends to increase in (2) (0.11) and decrease in (3) (-0.06).

Lastly, on the expenditure side, the signs of the significant parameters are similar for countries with debt ratios under and above 60% GDP, decreasing primary spending facing economic growth shocks (both in elections and in the remaining period). Furthermore, in

non-electoral years, the lower indebted countries appear to have a non-Ricardian response to positive debt shocks (0.11), increasing their expenditure.

[Table 4.12]

Table 4.12 shows that selected variables have a stronger ability to explain fiscal policy changes in countries outside the monetary union than to explain in the EMU member states, having a higher R-squares. Comparing the estimations (4) and (5), one can observe that primary balances have different kind of responses to macroeconomic variables, depending on the EMU membership.

Facing elections, whilst the EMU member states use to improve their primary balances facing economic growth accelerations (0.33) and debt increases (0.11), the response is negative (despite not statistically significant) in the non-EMU countries. In non-electoral years, the expansionist response to unemployment loses its significance outside the Eurozone, the economic growth became significant and there is a non-Ricardian behaviour facing a debt increase (deterioration on primary balance). Inside the EMU, the Ricardian response ceased to be observed in the absence of elections, and the response to interest rate shocks became statistically significant.

Observing the revenue and expenditure variations, the major difference found is on the revenue response to an interest rate shock. Once again, contrary to what happens in the non-Eurozone countries, the Member States usually increase their tax burden when the financing costs are higher, because they don't have the ability to manipulate monetary policy to reduce it. This effect is only statistically significant during elections (+0.11 p.p. in Government revenue). Furthermore, in non-election years, non-EMU countries

normally increase their primary expenditure facing debt shocks in the precedent year (0.14), not revealing a Ricardian behaviour.

4.6. Conclusion

This chapter considers the presence of political budget cycles in the Eurozone. Considering the influence of the last Great Recession, the impact of elections on fiscal policy was studied. After a first statistical analysis, using annual data from 19 Eurozone Member States between 1995 and 2017 and a time dummy to identify electoral periods, it was applied a GMM estimator (Arellano and Bond, 1991) to assess its impact on fiscal variables, controlling the response to other macroeconomic variables' shocks, such as the unemployment, economic growth or interest rates.

According to the results, the political budget cycles are mainly driven by the manipulation of direct tax burden, compensation to employees and other current expenditure. Corroborating with Vergne (2009) and the predictions of the Rogoff's "visibility expenditure" model, it shows that policy makers prefer to use current spending rather than target capital spending in electoral years.

In addition, the year before elections seems to be used to generate a fiscal buffer to apply more expansionary policies in the next year, since it has a positive influence on primary balance.

Furthermore, whilst in the period before 2007 the elections influenced positively the current expenditure, they have only statistically influenced the indirect tax burden since then. This change might have to do with the increase on the financing costs during the crisis and the expenditure restrictions imposed by Stability and Growth Pact rules.

The electoral influence on fiscal policy seems to differ from low and highly indebted countries, since voters are more concerned with the issue of fiscal sustainability. Indeed, policy makers are more interested in improving primary balance during elections, using better economic conjunctures to apply more restrictive policies.

Lastly, comparing fiscal responses to macroeconomic changes before and after countries joined the EMU, it was perceived that policy makers started to increase tax burden facing interest rate variations, since they have lost the ability to manipulate monetary policy.

4.7. References

Afonso, A. and Jalles, J. (2019). "Fiscal Reaction Functions Across the World: In Quest of Statistical (In)significance". *FinanzArchiv* 75(3), 207-228.

Alesina, A. and Perotti, R. (1995). "Fiscal Expansions and Fiscal Adjustments in OECD Countries". *Economic Policy* 10 (21), 205-248.

Alesina, A., Roubini, N. and Cohen, G.D. (1997). *Political Cycles and The Macroeconomy*. The MIT Press, Cambridge.

Andrikopoulos, A., Loizides, I. and Prodromidis, K. (2004). "Fiscal Policy and Political Business Cycles in the EU". *European Journal of Political Economy* 20, 125-152.

Arellano, M. and Bond, S. (1991). "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations". *Review of Economic Studies* 58, 277–297.

Buti, M. and Van den Noord, P. (2003). "Discretionary Fiscal Policy and Elections: The Experience of the Early Years of EMU". OECD Economics Department Working Paper No. 351.

Brender, A. and Drazen, A. (2005). "Political Budget Cycles in New Versus Established Democracies". *Journal of Monetary Economics*, 52(7), 1271–1295.

Brender, A. and Drazen, A. (2008). "How Do Budget Deficits and Economic Growth Affect Reelection Prospects? Evidence from a Large Panel of Countries". *American Economic Review*, 98(5), 2203–2220.

Chortareas, G., Logothetis, V. and Papandreou, A. (2018). "Elections and Opportunistic Budgetary Policies in Greece". *Managerial and Decision Economics* 40(7), 854-862.

Debrun, X., Hauner, D. and Kumar, M. (2009). “Independent Fiscal Agencies.” *Journal of Economic Surveys* 23, 44–81.

Drazen, A. and Eslava, M. (2005). “Electoral Manipulation Via Expenditure Composition: Theory and Evidence”. NBER Working Paper 11085.

Efthyvoulou, G. (2012). “Political budget cycles in the European Union and the impact of political pressures”. *Public Choice* 153(3), 295-327.

Eryaud, L., Gaspar, V. and Poghosyan, T. (2017). “Fiscal Politics in the Euro Area”. IMF Working Paper, WP/17/18.

Gonzales, M. (2002). “Do Changes in Democracy Affect the Political Budget Cycle? Evidence from Mexico”. *Review of Developmental Economics*, 6, 204–224.

Grossman, G. and Helpman, E. (1996). “Electoral Competition and Special Interest Politics”. *The Review of Economic Studies* 63(2), 265-286.

Katsimi, M. and Sarantides, V. (2010). “Do elections affect the composition of fiscal policy in developed, established democracies?”. Public Choice 151(2), 325-362.

Krogstrup S., Wyplosz C. (2009). “Dealing with the Deficit Bias: Principles and Policies”. In: Ayuso-i-Casals J., Deroose S., Flores E., Moulin L. (eds) *Policy Instruments for Sound Fiscal Policies*. Finance and Capital Markets Series. Palgrave Macmillan, London.

Milesi-Ferretti, G. M., Perotti, R. and Rostagno, M. (2002). “Electoral Systems and the Composition of Public Spending”. *Quarterly Journal of Economics* 117, 609-657.

Rogoff, K. and Sibert, A. (1988). “Elections and Macroeconomic Policy Cycles”. The Review of Economic Studies 55(1), 1-16.

Rogoff, K. (1990). “Equilibrium Political Budget Cycles”. *The American Economic Review* 80(1), 21-36.

Sapir, A. and Sekkat, K. (2002). “Political Cycles, Fiscal Deficits, and Output Spillovers in Europe”. *Public Choice* 111, 195-202.

Shi, M., and Svensson, J. (2006). “Political Budget Cycles: Do They Differ Across Countries and Why?” *Journal of Public Economics,* 90(8-9), 1367–1389.

Tobellini, G., and Persson, T. (2003). “Do Electoral Cycles Differ Across Political Systems?”. IGIER Working Paper No. 232.

Vergne, C. (2009). “Democracy, Elections and Allocation of Public Expenditure in Developing Countries”. *European Journal of Political Economy* 25(1), 63—77.

4.8. Appendices

4.8.1. Tables

Table 4. 1 - Empirical results in the related literature: summary

Authors (year)	Methodology	Sample	Period	Main Results
Gonzales (2002)	Pooled OLS	Mexico	1957-1999	- The elections affect infrastructure spending and transfers, which gets stronger under higher level of democracy.
Andrikopoulos et al. (2004)	ARMA	EU countries	1970-1998	- The great majority of the results suggest that the national governments of the EU countries did not take policy actions leading to the creation of electoral or partisan cycles in fiscal instruments and target variables; - The EU governments have been primarily concerned with the pursuit of stabilization policies rather than with policies giving rise to political cycles.
Brender and Drazen (2005)	Fixed Effects (FE)	106 countries	1960-2001	- There are evidences of political budget cycles, but only in new democracies.
Drazen and Eslava (2005)	GMM	Government and municipalities in Colombia	1987-2000	-There is a pre-electoral increase in targeted expenditures, and voters use to respond positively.
Shi and Svensson (2006)	GMM	85 countries	1975-1995	- Policital budget cycles effect is large in developing countries and small or non-existing in industrial countries, and the institutional indicators can explain large part of these differences.
Brender and Drazen (2008)	LOGIT	74 countries	1960-2003	- In developed countries and established democracies, election-year deficit spending and tax cuts are punished at the polls. A worsening of the government's fiscal balance in the election year actually reduces the probability that the leader is reelected; - In most countries loose fiscal policies over the incumbent's term of office, reflected in larger budget deficits relative to earlier periods, are associated with a statistically significant lower probability of reelection; - The real growth rate (per capita) is associated with a higher probability of reelection only in the less developed countries and in the new democracies.
Vergne (2009)	FE / GMM	45 developing countries	1975-2001	- Politicians shift the composition of pre-election spending towards current expenditure and away from capital expenditure; - They prefer to use broad-based rather than targeted spending at election times; - While political budget cycles disappear as the Government has more experience, the electoral impacts on the allocation of public spending endure.
Katsimi and Sarantides (2010)	Fixed Effects (FE)	19 high-income OECD	1972-1999	- Elections shift public spending towards current expenditures at the cost of public investment; - The is no evidence for na electoral cycle for both deficit and overall expenditures; - Endogenous elections seems to increase deficit, but not changing the composition of fiscal policy.
Chortareas et al. (2018)	OLS / Newey-West Sd.	Greece	1974-2011	- Facing elections, primary balance deteriorates via inceased expenditures, where compensation to employees use to increase; - Prolonged incumbencies affect negatively the primary balance and revenues; - There is no evidence of partisian effects in Greece's fiscal policies.

Table 4. 2 – Fiscal statistics in electoral years (EA19 average: 1995-2017)

Variable	Electoral	Non-Electioral	Difference
Balance	-3.05	-2.73	-0.32
Δ Balance	0.20	0.25	-0.05
CAPB	-0.13	0.30	-0.43
ΔCAPB	-0.04	0.08	-0.12
Δ Debt	1.25	0.94	0.31
Growth	2.66	2.70	-0.04
Δ Direct Taxes	0.01	0.04	-0.03
Δ Indirect Taxes	-0.05	0.05	-0.10
Δ Compensation to Employees	0.03	-0.06	0.09
Δ GFKF	-0.05	0.01	-0.06
Δ Other Current Expenditure	0.06	-0.05	0.11
Nº Observations	114	323	

Sources: AMECO and author's calculations.

Note: All the figures are presented in percentage of GDP and growth represents the real GDP annual growth. Since the figures are based on ESA 2010, the 1995 variations might have some missing values.

Table 4. 3 - Fiscal statistics in the year before elections (EA19 average: 1995-2017)

Variable	Electoral	Year before	Other
Balance	-3.05	-3.13	-2.37
Δ Balance	0.20	-0.10	0.31
CAPB	-0.13	-0.12	0.50
ΔCAPB	-0.04	-0.16	0.20
Δ Debt	1.25	1.13	0.91
Growth	2.66	2.71	2.70
Δ Direct Taxes	0.01	0.08	0.03
Δ Indirect Taxes	-0.05	0.06	0.05
Δ Compensation to Employees	0.03	-0.09	-0.04
Δ GFKF	-0.05	0.08	-0.02
Δ Other Current Expenditure	0.06	0.07	-0.11
Nº Observations	114	106	217

Sources: AMECO and author's calculations.

Note: All the figures are presented in percentage of GDP and growth represents the real GDP annual growth. Since the figures are based on ESA 2010, the 1995 variations might have some missing values

Table 4. 4 – Fiscal statistics before and after the Great Recession

(EA19 average: 1996-2006 vs 2007-2017)

Variable	1996 - 2006			2007 - 2017		
	Total	Electoral	Non-Elect.	Total	Electoral	Non-Elect.
Δ Direct Taxes	0.04	-0.08	0.07	0.03	0.07	0.01
Δ Indirect Taxes	0.05	-0.01	0.06	0.00	-0.09	0.04
Δ Compensation to Employees	-0.05	0.02	-0.07	-0.02	0.02	-0.03
Δ GFKF	0.01	-0.01	0.05	-0.06	-0.15	-0.03
Δ Other Current Expenditure	-0.17	0.20	-0.21	0.14	-0.05	0.12
Nº Observations	209	57	152	209	57	152

Sources: AMECO and author's calculations.
Note: All the figures are presented in percentage of GDP.

Table 4. 5 – Fiscal statistics by debt-to-GDP ratio (EA19 average: 1995-2017)

Variable	Debt <60%GDP		100%>Debt >60%		Debt >100%GDP	
	Electoral	Non-Elect.	Electoral	Non-Elect.	Electoral	Non-Elect.
Δ Direct Taxes	-0.03	-0.02	0.06	0.12	-0.02	0.05
Δ Indirect Taxes	-0.13	-0.04	0.00	0.13	0.03	0.14
Δ Compensation to Employees	0.00	-0.08	0.03	-0.04	0.04	-0.02
Δ GFKF	-0.11	0.05	-0.08	0.00	-0.07	-0.24
Δ Other Current Expenditure	-0.03	-0.04	0.18	-0.12	0.18	0.04
Nº Observations	54	153	41	116	19	54

Sources: AMECO and author's calculations.
Note: All the figures are presented in percentage of GDP.
Since the figures are based on ESA 2010, the 1995 variations might have some missing values.

Table 4. 6 – Fiscal statistics in EMU (EA19 average: 1995-2017)

Variable	EMU			Non-EMU		
	Total	Electoral	Non-Elect.	Total	Electoral	Non-Elect.
Δ Direct Taxes	0.01	-0.04	0.02	0.09	0.10	0.08
Δ Indirect Taxes	0.00	-0.03	0.01	0.09	-0.09	0.14
Δ Compensation to Employees	-0.02	0.04	-0.05	-0.06	-0.01	-0.08
Δ GFKF	-0.04	-0.13	0.00	0.02	-0.10	0.05
Δ Other Current Expenditure	0.04	0.18	-0.01	-0.13	-0.10	-0.14
Nº Observations	280	76	204	138	30	108

Sources: AMECO and author's calculations.
Note: All the figures are presented in percentage of GDP.
Since the figures are based on ESA 2010, the 1995 variations might have some missing values.

Table 4. 7 – Baseline output

	Fiscal Instrument					
	GMM			FE		
	Primary Balance	Revenue	Primary Expenditure	Primary Balance	Revenue	Primary Expenditure
Lagged Fiscal Variable	0.544***	0.765***	0.584***	0.548***	0.790***	0.600***
	(8.806)	(22.75)	(14.92)	(14.86)	(28.20)	(19.49)
Elections	-0.313***	-0.194*	0.169	-0.202	-0.145	-0.020
	(-2.737)	(-1.846)	(1.206)	(-0.774)	(-1.148)	(-0.081)
Year Before Elections	0.140*	-0.187	-0.270	0.122	-0.017	-0.235
	(1.796)	(-0.788)	(-0.962)	(0.464)	(-0.134)	(-0.938)
Real GDP Growth	0.187***	-0.134***	-0.328***	0.205***	-0.140***	-0.364***
	(3.194)	(-5.733)	(-13.51)	(4.641)	(-6.477)	(-8.550)
Δ Unemployment Rate	-0.639***	-0.136***	0.223***	-0.533***	-0.177***	0.291***
	(-5.551)	(-3.005)	(5.658)	(-5.056)	(-3.455)	(2.904)
Real LT Interest Rate	0.133**	-0.002	-0.087**	0.119***	0.053***	-0.068*
	(2.515)	(-0.052)	(-2.094)	(2.876)	(2.702)	(-1.727)
Constant				-0.682***	9.171***	17.98***
				(-3.069)	(7.661)	(13.75)
No. of obs.	345	345	345	345	345	333
No. of countires	19	19	19	19	19	19
Sargan Test	0.29	0.25	0.55			
J-statistic	15.2	16.0	11.8			
Instrument Rank	19	19	19			
R^2				0.66	0.97	0.90
Prob (F-stat.)				0.00	0.00	0.00
Redundant Fixed Effects Test						
t-stat.				2.45	3.14	5.37
p-val.				0.00	0.00	0.00

Note: The impacts are statistically significant at 1%, 5% and 10%, according to the classification ***, ** and * respectively (value of the t statistic in parentheses). The instruments used in the GMM regressions are lagged levels (two periods) of the dependent variable for the differenced equation and lagged (one period) for the remaining variables.

Table 4. 8 – Estimation by instrument

	Fiscal Instrument				
	Direct Taxes	**Indirect Taxes**	**Compensation to Employees**	**Other Current Expenditure**	**GFKF**
Lagged Fiscal Instrument	0.702***	0.670***	0.695***	0.734***	0.741***
	(16.88)	(5.444)	(18.42)	(32.00)	(4.182)
Elections	-0.070*	-0.037	0.110***	0.159***	-0.019
	(-1.758)	(-0.225)	(3.310)	(2.685)	(-0.171)
Year Before Elections	-0.153*	0.012	0.025	-0.151*	-0.090
	(-1.927)	(0.094)	(0.501)	(-1.760)	(-0.737)
Real GDP Growth	0.004	0.003	-0.087***	-0.271***	0.005
	(0.211)	(0.077)	(-4.865)	(-11.69)	(0.356)
Δ Unemployment Rate	-0.093**	-0.047	0.013	0.017	-0.013
	(-2.196)	(-0.736)	(0.815)	(0.321)	(-0.230)
Real LT Interest Rate	-0.000	0.000	-0.014	-0.045	-0.022
	(-0.004)	(0.004)	(-0.657)	(-1.528)	(-1.150)
No. of obs.	345	345	345	345	345
No. of countires	19	19	19	19	19
Sargan Test	0.42	0.33	0.37	0.38	0.55
J-statistic	14.4	15.7	15.1	15.0	12.8
Instrument Rank	20	20	20	20	20

Note: The impacts are statistically significant at 1%, 5% and 10%, according to the classification ***, ** and * respectively (value of the t statistic in parentheses). The instruments used in the GMM regressions are lagged levels (two periods) of the dependent variable for the differenced equation and lagged (one period) for the remaining variables.

Table 4. 9 – Estimation by period (before and after the crisis)

	Fiscal Instrument									
	1995 - 2006					2007 - 2017				
	Before Crisis					After Crisis				
	Direct Taxes	Indirect Taxes	Compensation to Employees	Other Current Expenditure	GFKF	Direct Taxes	Indirect Taxes	Compensation to Employees	Other Current Expenditure	GFKF
Lagged Fiscal Instrument	0.515***	0.499***	0.680***	0.682***	0.202***	0.689***	0.656***	0.634***	0.728***	0.593***
	(5.269)	(4.019)	(14.92)	(40.85)	(2.886)	(12.13)	(6.407)	(5.633)	(6.875)	(8.902)
Elections	-0.082	0.103	0.177***	0.265***	0.015	0.055	-0.167***	0.068	0.211	-0.019
	(-0.953)	(0.623)	(5.094)	(4.430)	(0.556)	(0.574)	(-3.134)	(0.753)	(0.731)	(-0.522)
Year Before Elections	-0.129	0.089	0.019	0.024	-0.163***	-0.091	-0.068	0.028	-0.265	0.080*
	(-1.387)	(0.441)	(0.404)	(0.322)	(-6.960)	(-0.949)	(-0.855)	(0.333)	(-1.609)	(1.798)
Real GDP Growth	0.014	0.051**	-0.107***	-0.208***	0.008**	-0.026	-0.021	-0.119***	-0.260***	0.003
	(0.555)	(2.214)	(-10.19)	(-10.27)	(2.209)	(-1.148)	(-1.401)	(-14.44)	(-5.231)	(0.570)
Δ Unemployment Rate	-0.098*	0.029	-0.012	-0.032	0.003	-0.106	-0.117***	0.014	0.090	0.067***
	(-1.976)	(0.358)	(-0.777)	(-0.650)	(0.220)	(-0.980)	(-2.720)	(0.423)	(0.631)	(2.623)
Real LT Interest Rate	0.084*	-0.051	0.025*	-0.054	-0.033**	-0.004	0.061***	-0.057***	0.055	-0.029
	(1.860)	(-0.900)	(1.712)	(-1.439)	(-2.581)	(-0.200)	(3.628)	(-2.655)	(0.746)	(-1.151)
No. of obs.	143	143	143	143	143	202	202	202	345	345
No. of countires	19	19	19	19	19	19	19	19	19	19
Sargan Test	0.62	0.24	0.27	0.81	0.30	0.38	0.75	0.38	0.25	0.56
J-statistic	10.9	17.2	16.7	8.6	15.1	13.9	10.2	13.9	15.9	11.6
Instrument Rank	19	20	20	19	19	19	20	19	19	19

Note: The impacts are statistically significant at 1%, 5% and 10%, according to the classification ***, ** and * respectively (value of the t statistic in parentheses). The instruments are lagged levels (two periods) of the dependent variable for the differenced equation, and one period for the remaining variables.

Table 4. 10 – Robustness Estimation (Debt)

		Fiscal Instrument								
		(1)			(2)			(3)		
					Debt < 60% GDP			Debt > 60% GDP		
		Primary Balance	Δ Revenue	Δ Primary Expenditure	Primary Balance	Δ Revenue	Δ Primary Expenditure	Primary Balance	Δ Revenue	Δ Primary Expenditure
	Constant	-0.620***	8.536***	18.43***	-0.726***	12.13***	18.72***	-0.667*	8.749***	18.17***
		(-3.170)	(6.752)	(10.58)	(-3.251)	(5.616)	(9.602)	(-1.912)	(5.306)	(5.831)
α	Lagged Fiscal Instrument	0.545***	-0.194***	-0.411***	0.462***	-0.273***	-0.416***	0.498***	-0.204***	-0.402***
		(11.15)	(-6.204)	(-9.026)	(6.335)	(-4.987)	(-7.678)	(6.339)	(-4.946)	(-5.200)
Elections		0.196**	-0.012	-0.522***	0.121*	-0.036	-0.403***	0.378**	0.036	-0.643***
	β_1 Real GDP Growth	(2.546)	(-0.330)	(-6.936)	(1.665)	(-0.518)	(-4.938)	(2.354)	(0.780)	(-4.427)
	β_2 Δ Unemployment Rate	-0.672***	-0.056*	0.065	-0.726***	-0.150**	-0.062	-0.592	-0.002	0.109
		(-3.090)	(-1.928)	(1.100)	(-3.271)	(-2.425)	(-0.776)	(-1.479)	(-0.080)	(1.077)
	β_3 Δ Debt-to-GDP t-1	0.079	0.048**	-0.040	-0.004	0.104**	0.027	0.084	0.015	-0.086
		(1.599)	(2.277)	(-0.858)	(-0.058)	(2.133)	(0.477)	(1.092)	(0.762)	(-1.101)
	β_4 Real LT Interest Rate	0.078	0.063	-0.149	0.010	-0.028	-0.098	0.123	0.132***	-0.123
		(1.061)	(1.364)	(-1.621)	(0.107)	(-0.307)	(-0.879)	(1.053)	(2.750)	(-0.828)
No Elections		0.183***	-0.113***	-0.397***	0.256***	-0.080***	-0.402***	0.091	-0.174***	-0.369***
	δ_1 Real GDP Growth	(3.887)	(-5.843)	(-10.42)	(5.386)	(-3.073)	(-12.97)	(0.995)	(-6.134)	(-4.193)
	δ_2 Δ Unemployment Rate	-0.488***	-0.001	-0.021	-0.229*	-0.105**	-0.085	-0.941***	0.062*	-0.021
		(-4.077)	(-0.073)	(-0.440)	(-1.755)	(-2.311)	(-1.391)	(-4.368)	(1.898)	(-0.238)
	δ_3 Δ Debt-to-GDP t-1	-0.061**	0.002	0.062**	-0.110**	0.023	0.114***	-0.029	-0.011	0.025
		(-1.972)	(0.180)	(2.175)	(-2.379)	(0.771)	(3.072)	(-0.642)	(-0.790)	(0.558)
	δ_4 Real LT Interest Rate	0.107**	0.009	0.000	0.074	0.025	-0.036	0.154	0.016	0.152
		(2.233)	(0.368)	(0.016)	(1.600)	(0.726)	(-0.877)	(1.576)	(0.419)	(1.261)
	N	372	372	372	175	176	176	196	196	196
	R^2	0.67	0.27	0.47	0.77	0.30	0.67	0.36	0.46	0.39
Redundant Fixed Effects Test										
	t-stat.	2.08	2.51	3.58	2.49	2.04	3.62	1.34	3.05	1.99
	p-val.	0.00	0.00	0.00	0.00	0.02	0.00	0.19	0.00	0.02

Note: The impacts are statistically significant at 1%, 5% and 10%, according to the classification ***, ** and * respectively (value of the t statistic in parentheses).

Table 4. 11 – Wald Tests (Table 4.10 - output 1)

Wald Test			
	Primary Balance		
	Null Hypotesis	t-stat.	p-val.
$\beta_1 - \delta_1 = 0$	Real GDP Growth	0.16	0.87
$\beta_2 - \delta_2 = 0$	Δ Unemployment Rate	-0.75	0.46
$\beta_3 - \delta_3 = 0$	Δ Debt-to-GDP t-1	2.75	0.01
$\beta_4 - \delta_4 = 0$	Real LT Interest Rate	-0.36	0.72
	Revenue		
	Null Hypotesis	t-stat.	p-val.
$\beta_1 - \delta_1 = 0$	Real GDP Growth	2.48	0.01
$\beta_2 - \delta_2 = 0$	Δ Unemployment Rate	-2.48	0.01
$\beta_3 - \delta_3 = 0$	Δ Debt-to-GDP t-1	1.83	0.07
$\beta_4 - \delta_4 = 0$	Real LT Interest Rate	1.06	0.29
	Primary Expenditure		
	Null Hypotesis	t-stat.	p-val.
$\beta_1 - \delta_1 = 0$	Real GDP Growth	-1.56	0.12
$\beta_2 - \delta_2 = 0$	Δ Unemployment Rate	2.04	0.04
$\beta_3 - \delta_3 = 0$	Δ Debt-to-GDP t-1	-2.03	0.04
$\beta_4 - \delta_4 = 0$	Real LT Interest Rate	-1.50	0.14

Table 4. 12 – Robustness estimation (EMU)

		Fiscal Instrument									
		(1)			(4) EMU			(5) non - EMU			
		Primary Balance	Δ Revenue	Δ Primary Expenditure	Primary Balance	Δ Revenue	Δ Primary Expenditure	Primary Balance	Δ Revenue	Δ Primary Expenditure
	Constant	-0.620***	8.536***	18.43***	-0.668***	8.022***	16.76***	-0.554*	9.238***	24.14***
		(-3.170)	(6.752)	(10.58)	(-2.797)	(4.877)	(7.044)	(-1.743)	(3.100)	(8.375)
α	Lagged Fiscal Instrument	0.545***	-0.194***	-0.411***	0.559***	-0.185***	-0.362***	0.142	-0.213**	-0.580***
		(11.15)	(-6.204)	(-9.026)	(9.793)	(-4.747)	(-6.057)	(1.302)	(-2.571)	(-6.678)
Elections	β_1 Real GDP Growth	0.196**	-0.012	-0.522***	0.324***	-0.042	-0.646***	-0.050	-0.017	-0.477***
		(2.546)	(-0.330)	(-6.936)	(3.179)	(-0.944)	(-6.213)	(-0.461)	(-0.170)	(-3.801)
	β_2 Δ Unemployment Rate	-0.672***	-0.056*	0.065	-0.659**	-0.031	0.050	-0.872**	-0.081	0.087
		(-3.090)	(-1.928)	(1.100)	(-2.524)	(-0.993)	(0.684)	(-2.540)	(-0.858)	(0.670)
	β_3 Δ Debt-to-GDP t-1	0.079	0.048**	-0.040	0.108*	0.024	-0.084	-0.063	0.111	-0.007
		(1.599)	(2.277)	(-0.858)	(1.776)	(1.059)	(-1.392)	(-0.749)	(1.593)	(-0.088)
	β_4 Real LT Interest Rate	0.078	0.063	-0.149	0.103	0.112**	-0.099	-0.098	-0.054	-0.184
		(1.061)	(1.364)	(-1.621)	(1.112)	(2.166)	(-0.843)	(-0.948)	(-0.449)	(-1.243)
No Elections	δ_1 Real GDP Growth	0.183***	-0.113***	-0.397***	0.176***	-0.092***	-0.422***	0.191***	-0.161***	-0.399***
		(3.887)	(-5.843)	(-10.42)	(2.676)	(-3.619)	(-7.406)	(3.279)	(-4.434)	(-8.845)
	δ_2 Δ Unemployment Rate	-0.488***	-0.001	-0.021	-0.901***	0.021	-0.038	-0.060	-0.024	-0.034
		(-4.077)	(-0.073)	(-0.440)	(-5.311)	(0.797)	(-0.589)	(-0.419)	(-0.350)	(-0.344)
	δ_3 Δ Debt-to-GDP t-1	-0.061**	0.002	0.062**	-0.024	0.002	0.018	-0.218***	-0.036	0.137**
		(-1.972)	(0.180)	(2.175)	(-0.655)	(0.142)	(0.517)	(-3.831)	(-0.865)	(2.553)
	δ_4 Real LT Interest Rate	0.107**	0.009	0.000	0.148*	0.058	0.111	-0.020	-0.052	-0.070
		(2.233)	(0.368)	(0.016)	(1.905)	(1.523)	(1.270)	(-0.419)	(-1.106)	(-1.201)
	N	372	372	372	273	273	273	99	99	99
	R^2	0.67	0.27	0.47	0.68	0.27	0.43	0.83	0.45	0.73
Redundant Fixed Effects Test										
	t-stat.	2.08	2.51	3.58	1.38	1.89	2.13	3.14	0.94	2.38
	p-val.	0.00	0.00	0.00	0.14	0.02	0.01	0.00	0.54	0.01

Note: The impacts are statistically significant at 1%, 5% and 10%, according to the classification ***, ** and * respectively (value of the t statistic in parentheses).

4.8.2. Elections

Table C 1 – Elections characteristics

Country	Electoral Years	Nº of Elections	Heads of Government	Type
Belgium	1995; 1999; 2004; 2007; 2009; 2010; 2014	7	Prime-Minister	Federal
Germany	1998; 2002; 2005; 2009; 2013; 2017	6	Chancellor	Federal
Estonia	1995; 1999; 2003; 2007; 2011; 2015	6	Prime-Minister	Parliamentary
Ireland	1997; 2002; 2007; 2011; 2016	5	Prime-Minister	General Elections
Greece	1996; 2000; 2004; 2007; 2009; 2012; 2015	7	Prime-Minister	Parliamentary
Spain	1996; 2000; 2004; 2008; 2011; 2015; 2016	7	Prime-Minister	General Elections
France	1997;2002; 2007, 2012; 2017	5	President	Presidential
Italy	1996; 2001; 2006; 2008; 2013	5	President	General Elections
Cyprus	1998; 2003; 2008; 2013	4	President	Presidential
Latvia	1995; 1998; 2002; 2006; 2010; 2011; 2014	7	Prime-Minister	Parliamentary
Lithuania	1996; 2000; 2004; 2008; 2012; 2016	6	Prime-Minister	Parliamentary
Luxembourg	1999; 2004; 2009; 2013	4	Prime-Minister	General Elections
Malta	1996; 1998; 2003; 2008; 2013; 2017	6	Prime-Minister	General Elections
Netherlands	1998; 2002; 2003; 2006; 2010; 2012; 2017	7	Prime-Minister	General Elections
Austria	1995; 1999; 2002; 2006; 2008; 2013; 2017	7	Chancellor	Parliamentary
Portugal	1995; 1999; 2002; 2005; 2009; 2011; 2015	7	Prime-Minister	Parliamentary
Slovenia	1996, 2000; 2004; 2008; 2011; 2014	6	Prime-Minister	Parliamentary
Slovakia	1998; 2002; 2006; 2010; 2012; 2016	6	Prime-Minister	Parliamentary
Finland	1995; 1999; 2003; 2007; 2011; 2015	6	Prime-Minister	Parliamentary

Source: Norsk Senter For ForskningsData (European Election Database)

4.8.3. Summary Statistics

Table C 2 – Summary statistics, full panel, 1995-2017

STATISTICS	Mean	Median	Maximum	Minimum	Std. Dev.	Kurtosis	Observ.
Balance	-2.75	-2.55	6.86	-32.06	3.69	-1.52	437
Primary balance	-0.05	0.16	9.57	-29.23	3.45	14.9	437
Debt	60.62	58.88	178.91	3.66	35.93	3.28	437
Real GDP growth	2.72	2.74	25.12	-14.81	3.68	9.13	437
Unemployment rate	9.22	8.40	27.50	1.90	4.45	5.19	435
Real LT interest rate	2.35	2.07	24.40	-12.35	3.33	13.39	396
Direct taxes	10.91	10.59	20.47	4.35	3.15	2.35	437
Indirect Taxes	12.89	12.86	17.15	8.45	1.63	2.45	437
Compensation to employees	10.94	10.87	15.00	7.03	1.82	2.19	437
GFKF	3.58	3.68	6.32	1.55	1.03	2.51	437
Other current expenditure	28.81	28.93	39.70	14.00	5.96	1.94	437

Source: AMECO Database

4.8.4. Unit Root Test

Table C 3 – Unit root tests

Variable	Method	Statistic	Prob.	Obs
Balance	Levin, Lin & Chu t	-2.03	0.02	399
	Fisher	87.21	0.00	
CAPB	Levin, Lin & Chu t	-2.69	0.00	399
	Fisher	74.56	0.00	
Direct Taxes	Levin, Lin & Chu t	-2.06	0.02	399
	Fisher	59.86	0.01	
Indirect Taxes	Levin, Lin & Chu t	-1.05	0.15	399
	Fisher	52.06	0.06	
Compensation to Employees	Levin, Lin & Chu t	-4.08	0.00	399
	Fisher	76.11	0.00	
GFKF	Levin, Lin & Chu t	-1.58	0.06	399
	Fisher	63.46	0.01	
Other C. Expendiutre	Levin, Lin & Chu t	-3.45	0.00	399
	Fisher	68.97	0.00	
Primary Balance	Levin, Lin & Chu t	-2.06	0.02	399
	Fisher	75.05	0.00	
Revenue	Levin, Lin & Chu t	-0.97	0.16	399
	Fisher	51.76	0.07	
Prim. Expenditure	Levin, Lin & Chu t	-2.45	0.01	399
	Fisher	65.99	0.00	

Note: The values are statistically significant at 1%, 5% and 10%. Levin, Lin & Chu t method for common unit root process, and Fisher tests for individual unit root process.

5. Conclusions

The fiscal policy is usually described as a set of decisions and rules related to taxes, to government expenditure, and to decisions to allocate resources. It is broadly used by policy makers to influence economic activity and to stabilize the business cycle, namely through the control of available income, the reallocation of resources, the supply of goods and services or the correction of market failures.

However, the amounts of sovereign debt accumulated by several European countries have been jeopardizing the sustainability of public finances and restricting political decisions, with repercussions on sovereign financing costs and on people's welfare. Thus, the fiscal policy - and its determinants and results - has become a preeminent issue since the last Great Recession.

The present Thesis, titled "Essays on fiscal policy in the Eurozone", studies the political and macroeconomic issues of fiscal policy in the Economic and Monetary Union during the last decades, and tries to explain the macroeconomic effects of fiscal policy, why some effects are different from those expected according to the Keynesian theory - the so called "non-Keynesian effects of fiscal policy" - , and how the political cycles might influence the policy making strategies. Moreover, it was also assessed how the answers for those questions might change according to relevant macroeconomic and time characteristics, such as the debt-to-GDP ratio, the EMU membership, or the last Great Recession (before and after).

Thus, the thesis is composed by three essays: i) Fiscal Multipliers in the Eurozone: A SVAR Analysis; ii) Fiscal Episodes in the EMU: Elasticities and Non-Keynesian Effects;

and iii) Political Budget Cycles in the Eurozone. The essays are presented in the chapters 2, 3 and 4 of this Thesis, respectively.

In the first essay, after discussing some contributions in the literature regarding fiscal multipliers and the underlying theories, we computed the value of fiscal multipliers – i.e., the ratio of a change in output to a unitary change in the fiscal instrument - for government primary expenditure, income and wealth taxes and for production and import taxes, in the Eurozone countries since the creation of the currency union (2000Q1-2016Q4). Thus, we tried to understand how the values can vary according to the public debt level, the pace of economic growth, and the output gap.

Imposing quarterly fiscal shocks, the results showed that government expenditure had a positive effect on output, with an annual accumulated multiplier of 0.44 (0.62 after two years), whereas tax multipliers presented negative signs: the income and wealth and the production and import taxes stood at −0.11 and −0.55, respectively. Furthermore, the spending multiplier showed a higher value for countries with lower levels of public debt, during recessions, and in countries with negative output gaps. On the other hand, tax shocks seemed to be recessive in highly indebted countries and those facing positive output gaps.

The second essay is focused in the non-Keynesian effects of fiscal policy. The Keynesian theory assumes that, since a proportion of economic resources is unemployed and a certain fraction of the population is liquidity-constrained, a change in the available income should have a significant impact on aggregate demand, resulting in an economic stimulus. However, the empirical evidences show that it is not always observed.

After studying how to properly identify fiscal episodes – i.e., clear policy actions, we analysed how the macroeconomic responses to fiscal policy varies during fiscal

consolidations, expansions and “normal times”, in order to find possible sources of non-Keynesian effects. Thus, we estimate short- and long-run elasticities of private consumption for fiscal instruments, using a Fixed Effects model for the 19-euro area countries during the period of 1960-2017.

According to the results, positive “tax revenue” elasticities indicate that consumers might have a Ricardian behaviour, whereby they perceive an increase in taxation to be a sign of future government spending. Furthermore, “social benefits” appear to have a non-Keynesian effect on private consumption and are more contractionary in consolidations than in both expansions and “normal times”.

In addition, using a narrative approach to identify fiscal consolidations (instead of the broadly used CAPB-approach), it is seen that private consumption continues to exhibit a non-Keynesian response to tax increases, both in the short and long-run, and “other expenditures” have a recessive impact during “normal times”. Also, after the launch of the EMU, expansionary fiscal consolidations became harder to observe, and “other expenditure” and “investment” lost their non-Keynesian role.

The third and final essay provides evidence of the electoral influence on fiscal policy in the Eurozone countries. Using data from EA19 in 1995-2017 and a time dummy to identify election years, it was applied an IV-GMM estimator to assess its impact on fiscal instruments. According to the results, there is evidence of political budget cycles in the Eurozone countries.

The incumbent Governments seem to increase current spending and to decrease the direct tax burden in electoral years. In addition, since the Great Recession, Member States have lost their ability to manipulate the Government spending for electoral purposes and began to decrease the indirect tax burden. Furthermore, after countries joined the EMU, policy

makers began to increase tax burden facing interest rate shocks, since they have lost the ability to use monetary policy.

For future studies, beyond the scope of this thesis, it would be interesting to give more emphasis on the sovereign financing costs, namely to assess: how financial markets react to fiscal performance, to forecasts and to political statements; what the role of the credit rating agencies might be; and how the risk perception has changed facing different types of economic and financial crises.

To conclude, I hope this thesis will be useful, not only to obtain the degree of Doctor in Economics, but also to give an interesting contribution to the existing literature, with an additional analysis and reflexion on the macroeconomic and political effects of fiscal policy in the Eurozone countries.

6. Bibliography

Afonso, A. (2001). "Non-Keynesian Effects of Fiscal Policy in the EU-15". ISEG/UTL – Technical University of Lisbon, Department of Economics, Working Paper No. 07/2001/DE/CISEP.

Afonso, A. (2010). "Expansionary Fiscal Consolidations in Europe: New Evidence". *Applied Economics Letters* 17(2), 105-109.

Afonso, A., Agnello, L. and Furceri, D., (2010). "Fiscal policy responsiveness, persistence and discretion". *Public Choice*, 145, 503-530.

Afonso, A. and Jalles, J. (2014). "Assessing Fiscal Episodes". *Economic Modelling* 37, 255-270.

Afonso, A. and Jalles, J. (2019). "Fiscal Reaction Functions Across the World: In Quest of Statistical (In)significance". *FinanzArchiv* 75(3), 207-228.

Afonso, A. and Leal, F. S. (2019). "Fiscal Multipliers in the Eurozone: an SVAR Analysis". *Applied Economics*, 51(51), 5577-5593.

Afonso, A. and Leal, F. S. (2020). "Fiscal episodes in the Economic and Monetary Union: Elasticities and non-Keynesian effects", International Journal of Finance and Economics 2020, 1–23.

Afonso, A. and Martins, L. (2016). "Monetary Developments and Expansionary Fiscal Consolidations: Evidence from the EMU*". International Journal of Finance & Economics*, 21, 247-265.

Afonso, A. and Sousa, R. M. (2011). "The Macroeconomic Effects of Fiscal Policy". *Applied Economics*, 44(34): 4439-4454.

Alesina, A. and Ardagna, S. (1998). "Tales of Fiscal Contractions". *Economic Policy*, 27, 487-545.

Alesina, A. and Ardagna, S. (2010). "Large Changes in Fiscal Policy: Taxes versus Spending". Chapter in NBER book *Tax Policy and the Economy*, 24, 35-68.

Alesina, A., Barbiero, O., Favero, C., Giavazzi, F. and Paradisi, M. (2017). "The Effects of Fiscal Consolidations: Theory and Evidence". NBER Working Paper No. 23385.

Alesina, A., Favero, C. and Giavazzi, F. (2018). "What do we know about the effects of Austerity?" NBER Working Papers No. 24246.

Alesina, A. and Perotti R. (1995). "Fiscal Expansions and Adjustments in OECD Countries". *Economic Policy*, 21, 205-248.

Alesina, A. and Perotti R. (1997). "Fiscal Expansions in OECD Countries: Composition and Macroeconomic Effects". IMF Staff Papers, 44(2), 210-248. Washington: IMF.

Alesina, A., Perotti R. and Tavares, J. (1998). "The Political Economy of Fiscal Adjustments". *Brookings Papers on Economic Activity*, 1, 197-266.

Alesina, A., Roubini, N. and Cohen, G.D. (1997). *Political Cycles and The Macroeconomy*. The MIT Press, Cambridge.

Andrikopoulos, A., Loizides, I. and Prodromidis, K. (2004). "Fiscal Policy and Political Business Cycles in the EU". *European Journal of Political Economy* 20, 125-152.

Arellano, M. and Bond, S. (1991). "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations". *Review of Economic Studies* 58, 277–297.

Arestis, P., Kaya, A. and Sen, H. (2018). “Does fiscal consolidation promote economic growth and employment? Evidence from the PIIGGS countries”. *European Journal of Economics and Economic Policies: Intervention*, 15(3), 289-312.

Argimón, I., González-Páramo, J. and Roldán, J. (1997). “Evidence of public spending crowding-out from a panel of OECD countries.” *Applied Economics*, 29(8), 1001-1010.

Auerbach, A. and Gorodnichenko, Y. (2012). “Fiscal Multipliers in Recession and Expansion”, NBER Chapters, in: Fiscal Policy After the Financial Crisis, 63-98, NBER, Inc.

Barbosa, L. and Costa, S. (2010). "Determinantes dos spreads soberanos na área do euro no contexto da crise económica e financeira.". Boletim Económico | Banco de Portugal (Autumn): 143-164. Lisbon: Banco de Portugal.

Barrel, R., Holland, D. and Hurst, I. (2012). “Fiscal Consolidation: Part 2. Fiscal Multipliers and Fiscal Consolidations”. OECD Economics Department Working Papers No. 933. Paris: OECD.

Barro, R. (1974). “Are Government Bonds Net Wealth?” *Journal of Political Economy*, 82(6), 1095-1117.

Bernheim, B. (1989). “A Neoclassical Perspective on Budget Deficits”. *Journal of Economic Perspectives*, 3(2), 55-72.

Bertola, G. and Drazen, A. (1993). “Trigger Points and Budget Cuts: Explaining the Effects of Fiscal Austerity”. *American Economic Review*, 83(1), 11-26.

Batini N., Callegari G., Melina G. (2012). “Successful Austerity in the United States, Europe and Japan”, IMF Working Paper 12/190. Washington: IMF.

Bernheim, B. D. (1989). “A Neoclassical Perspective on Budget Deficits” *Journal of Economic Perspectives*, 3(2), 55-72.

Blanchard, O. (1990). “Comment, on Giavazzi and Pagano (1990)”, in Blanchard, O. and Fischer, S. (eds), NBER Macroeconomics Annual 1990, 111-116.

Blanchard, O. and Leigh, D. (2013), “Growth Forecast Errors and Fiscal Multipliers”, *American Economic Review*, 103(3), 117-120.

Blanchard, O. and Perotti, R. (2002). “An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output” *Quarterly Journal of Economics,* 117(4), 1329-1368.

Born, B., Jüssen, F., and Müller, G. J. (2013). “Exchange Rate Regimes and Fiscal Multipliers” *Journal of Economic Dynamics and Control,* 37(2), 446-465.

Boussard, J., Castro, F. and Salto, M. (2012). “Fiscal Multipliers and Public Debt Dynamics in Consolidations”. *European Economy - Economic Papers 2008 – 2015,* 460.

Brender, A. and Drazen, A. (2005). “Political Budget Cycles in New Versus Established Democracies”. *Journal of Monetary Economics*, 52(7), 1271–1295.

Brender, A. and Drazen, A. (2008). “How Do Budget Deficits and Economic Growth Affect Reelection Prospects? Evidence from a Large Panel of Countries”. *American Economic Review*, 98(5), 2203–2220.

Brinca, P., Holter, A. H., Krussel, P. and Malafry, L. (2016). “Fiscal multipliers in the 21st century” *Journal of Monetary Economics*, 77, 53-69.

Buti, M. and Van den Noord, P. (2003). “Discretionary Fiscal Policy and Elections: The Experience of the Early Years of EMU”. OECD Economics Department Working Paper No. 351.

Carvalho, V. (2009). “Non-Keynesian Effects of a Fiscal Policy in a New-Keynesian General Equilíbrium Model for the Euro Area”. Doctoral Thesis, Faculdade de Economia da Universidade do Porto.

Chortareas, G., Logothetis, V. and Papandreou, A. (2018). “Elections and Opportunistic Budgetary Policies in Greece”. *Managerial and Decision Economics* 40(7), 854-862.

Combes, J. L., Minea A., Mustea L., and Sow M. (2014). “The Euro and the Crisis: Evidence on Recent Fiscal Multipliers”. *Revue d’Economie Politique*, 124(6), 1013-1038.

Combes, J. L., Minea, A., Mustea, L. and Yogo, T. (2016). “Output Effects of Fiscal Stimulus in Central and Eastern European Countries”. *Post-Communist Economies*, 28(1), 108-127.

Cournède, B. and Gonand, F. (2006). “Restoring Fiscal Sustainability in the Euro Area: Raise Taxes or Curb Spending?” OECD Economics Department Working Paper, 520. Paris: OECD.

Cuestas, J. and Ordóñez, J. (2018). “Fiscal consolidation in Europe: has it worked?”. *Applied Economics Letters*, 25(16), 1179-11182.

Debrun, X., Hauner, D. and Kumar, M. (2009). “Independent Fiscal Agencies.” *Journal of Economic Surveys* 23, 44–81.

Devries, P., Guajardo, J., Leigh, D. and Pescatori, A. (2011). “A New Action-Based Dataset of Fiscal Consolidation”. IMF Working Paper 11/128. Washington: IMF.

Diamond, P. (1965). “National Debt and Neoclassical Economic Growth.” *American Economic Review*, 55, 1125-1150.

Drazen, A. and Eslava, M. (2005). “Electoral Manipulation Via Expenditure Composition: Theory and Evidence”. NBER Working Paper 11085.

Efthyvoulou, G. (2012). “Political budget cycles in the European Union and the impact of political pressures”. *Public Choice* 153(3), 295-327.

Eryaud, L., Gaspar, V. and Poghosyan, T. (2017). “Fiscal Politics in the Euro Area”. IMF Working Paper, WP/17/18.

Feldstein, M. (1982). “Government Deficits and Aggregate Demand”, *Journal of Monetary Economics*, 9(1), 1-20.

Giavazzi, F. and Pagano, M. (1990). “Can Severe Fiscal Contractions Be Expansionary? Tales of Two Small European Countries”, NBER Working Paper No. 3372.

Giavazzi, F. and Pagano, M. (1996). “Non-Keynesian Effects of Fiscal Policy Changes: International Evidence and the Swedish Experience”, *Swedish Economic Policy Review*, 3(1), 67-103.

Gonzales, M. (2002). “Do Changes in Democracy Affect the Political Budget Cycle? Evidence from Mexico”. *Review of Developmental Economics,* 6, 204–224.

Grossman, G. and Helpman, E. (1996). “Electoral Competition and Special Interest Politics”. *The Review of Economic Studies* 63(2), 265-286.

Guajardo, J. Leigh, D. and Pescatori, A. (2014). “Expansionary Austerity: International Evidence”, *Journal of the European Economic Association* 12 (4), 949-968.

Gupta, S., Jalles, J. T., Mulas-Granados, C. and Schena, M. (2018). “Planned Fiscal Adjustments: Do Governments Fulfil Their Commitments?”, *European Union Politics* 19(3), 383-407.

Ilzetski, E., Mendoza, E. G. and Végh, C. A. (2013). “How Big (Small?) are Fiscal Multipliers?”. *Journal of Monetary Economics*, 60(2), 339-254.

IMF (1993). "Structural Budget Indicators for the Major Industrial Countries", *World Economic Outlook,* 99-103. Washington: IMF.

Katsimi, M. and Sarantides, V. (2010). “Do elections affect the composition of fiscal policy in developed, established democracies?”. Public Choice 151(2), 325-362.

Krogstrup S., Wyplosz C. (2009). “Dealing with the Deficit Bias: Principles and Policies”. In: Ayuso-i-Casals J., Deroose S., Flores E., Moulin L. (eds) *Policy Instruments for Sound Fiscal Policies*. Finance and Capital Markets Series. Palgrave Macmillan, London.

Larch, M. and Turrini, A. (2010). “The Cyclically Adjusted Budget Balance in EU Fiscal Policymaking”, *Intereconomics,* 45(1), 48-66.

Leeper E. M., Traum, N. and Walker, T. B. (2017). “Clearing Up the Fiscal Multiplier Morass”. *American Economic Review*, 107(8), 2409-2454.

Lucas, R. (1973). “Some International Evidence on Output-Inflation Tradeoffs”. *American Economic Review,* 63(3), 326-334.

McDermott, C. and Wescott, R. (1996). “An Empirical Analysis of Fiscal Adjustments”, *IMF Staff Papers,* 43(4), 725-753.

Milesi-Ferretti, G. M., Perotti, R. and Rostagno, M. (2002). “Electoral Systems and the Composition of Public Spending”. *Quarterly Journal of Economics* 117, 609-657.

Miller, S. and Russek, F. (1999). “The Relationship between large fiscal adjustments and short-term output growth under alternative fiscal policy regimes”, University of Connecticut Working Paper.

Minea, A. and Mustea, L. (2015). “A fresh look at fiscal multipliers: one size fits it all? Evidence from the Mediterranean area”. *Applied Economics,* 47(26), 2728-2744.

Mourre, G. and Princen, S. (2015). “Tax Revenue Elasticities Corrected for Policy Changes in the EU”. *European Commission Discussion Paper* No.18. Brussels: European Commission.

Muñoz, E. and Olaberria, E. (2019). “Are Budget Rigidities a Source of Fiscal Distress and a Constraint for Fiscal Consolidation?” World Bank Policy Research Working Paper No. 8957. Washington: World Bank.

OECD (1996). "The experience with fiscal consolidation in OECD countries", Economic Outlook 59, 3341. Paris: OECD.

Prince, R., Dang, T. and Botev, J. (2015). “Adjusting Fiscal Balances for The Business Cycle: New Tax and Expenditure Elasticity Estimates for OECD Countries”. OECD Economics Department Working Papers No. 1275. Paris: OECD.

Reinhart, C. M. and Rogoff, K. S. (2010). "Growth in a time of debt." *American Economic Review* 100(2), 573-578.

Riera-Crichton, D., Végh, and Vuletin, G. (2015). “Procyclical and Coutercyclical Fiscal Multipliers: Evidence from OECD Countries”. *Journal of International Money and Finance*, 52, 15-31.

Rogoff, K. and Sibert, A. (1988). “Elections and Macroeconomic Policy Cycles”. The Review of Economic Studies 55(1), 1-16.

Rogoff, K. (1990). “Equilibrium Political Budget Cycles”. *The American Economic Review* 80(1), 21-36.

Samuelson, P. A. and Nordhaus, W. D. (2001). *Economics*, New York: McGraw-Hill Education.

Sapir, A. and Sekkat, K. (2002). “Political Cycles, Fiscal Deficits, and Output Spillovers in Europe”. *Public Choice* 111, 195-202.

Shi, M., and Svensson, J. (2006). “Political Budget Cycles: Do They Differ Across Countries and Why?” *Journal of Public Economics*, 90(8-9), 1367–1389.

Spilimbergo, A., Symansky, S. and Schindler, M. (2009). “Fiscal Multipliers” *IMF Staff Position Note*, SPN/09/11. Washington: IMF.

Stockhammer, E., Qazizada, W. and Gechert, S. (2019). “Demand Effects of Fiscal Policy since 2008”. *Review of Keynesian Economics*, 7(1), 57-74.

Sutherland, A. (1997). “Fiscal Crises and Aggregate Demand: Can High Public Debt Reverse the Effects of Fiscal Policy?” *Journal of Public Economics*, 65(2), 147-162.

Tobellini, G., and Persson, T. (2003). “Do Electoral Cycles Differ Across Political Systems?”. IGIER Working Paper No. 232.

van Aarle, B. and Garretsen, H. (2003). “Keynesian, Non-Keynesian or No Effects of Fiscal Policy Changes? The EMU case”. *Journal of Macroeconomics*, 25(2), 213-240.

Vergne, C. (2009). “Democracy, Elections and Allocation of Public Expenditure in Developing Countries”. *European Journal of Political Economy* 25(1), 63-77.

Weyerstrass, K.; Jaenicke, J.; Neck, R.; Haber, G.; van Aarle, B.; Schoors, K.; Gobbin, N. and Claeys, P. (2006). “Economic Spillover and Policy Coordination in the Euro Area”, European Commission, Economic Papers No 246. Brussels: European Commission.

Wolswijk, G. (2007). “Short and Long-Run Tax Elasticities: The Case of the Netherlands”. *ECB Working Paper Series*, No.763. Frankfurt: ECB.

Yang, W., Fidrmuc, J. and Ghosh, S. (2015). “Macroeconomic Effects of Fiscal Adjustment: A Tale of Two Approaches”, *Journal of International Money and Finance* 57, 31-60.

Zubairy, S. (2014). “On Fiscal Multipliers: Estimates from a Medium Scale DGSE Model”. *International Economic Review*, 55, 169-195.